FEBRUARY 23, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

FOUNDRIES INSTALL PRECIPITATORS; ABATE SMOKE NUISANCE

Industrialist Heads Hospital Fund Drive

Metalworking Plants Report $17 Million Payroll in Community

Machine Tool Builders Explain Contribution To Defense Program

METALWORKING EXECUTIVE SPARKS CHEST CAMPAIGN

Park Development Plan Offered by Industry

Good Neighbor Policy

How good are your public relations? To improve them, turn to page 53 for the first in a special management series

✔ CMP OPEN-ENDING
Not Much Immediate Help, p. 45

✔ VOLUME PLATING OF SMALL PARTS
Handling Equipment Speeds Line, p. 88

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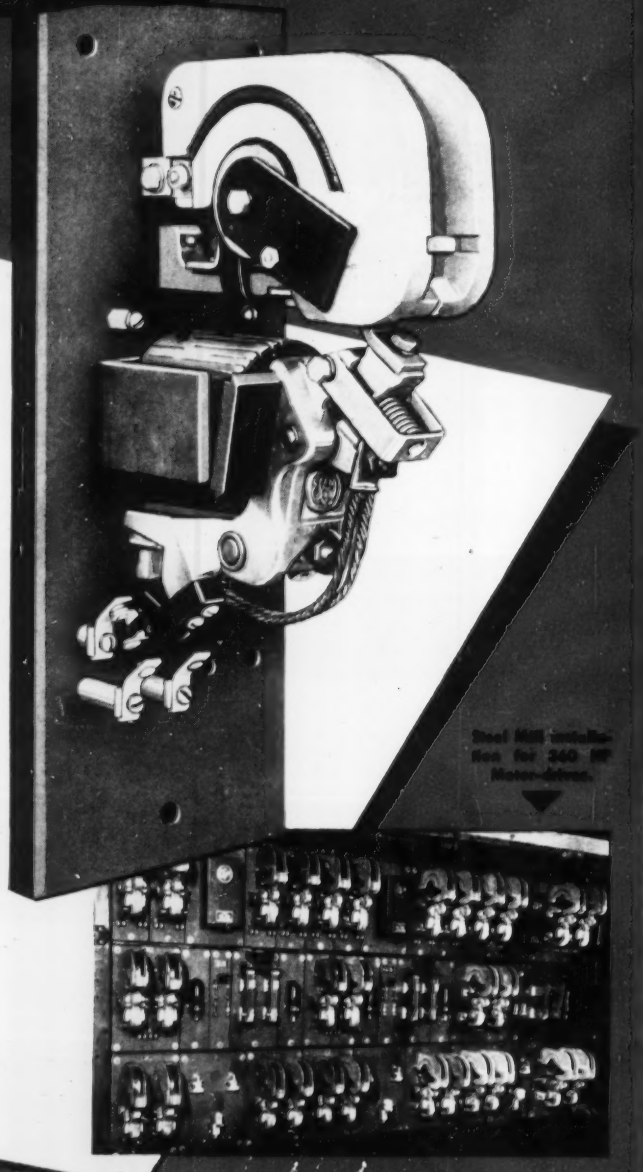
Designed for Low Up-Keep

PROVEN IN HUNDREDS OF PLANTS

EC&M

LINE-ARC

CONTACTORS



You can meet production demands better with EC&M Magnetic Controllers, because they are easy to get along with, easy to service on a preventive maintenance basis and low on upkeep.

The LINE-ARC principle keeps costs down and saves maintenance-time. Don't overlook these important advantages when buying mill and crane control:

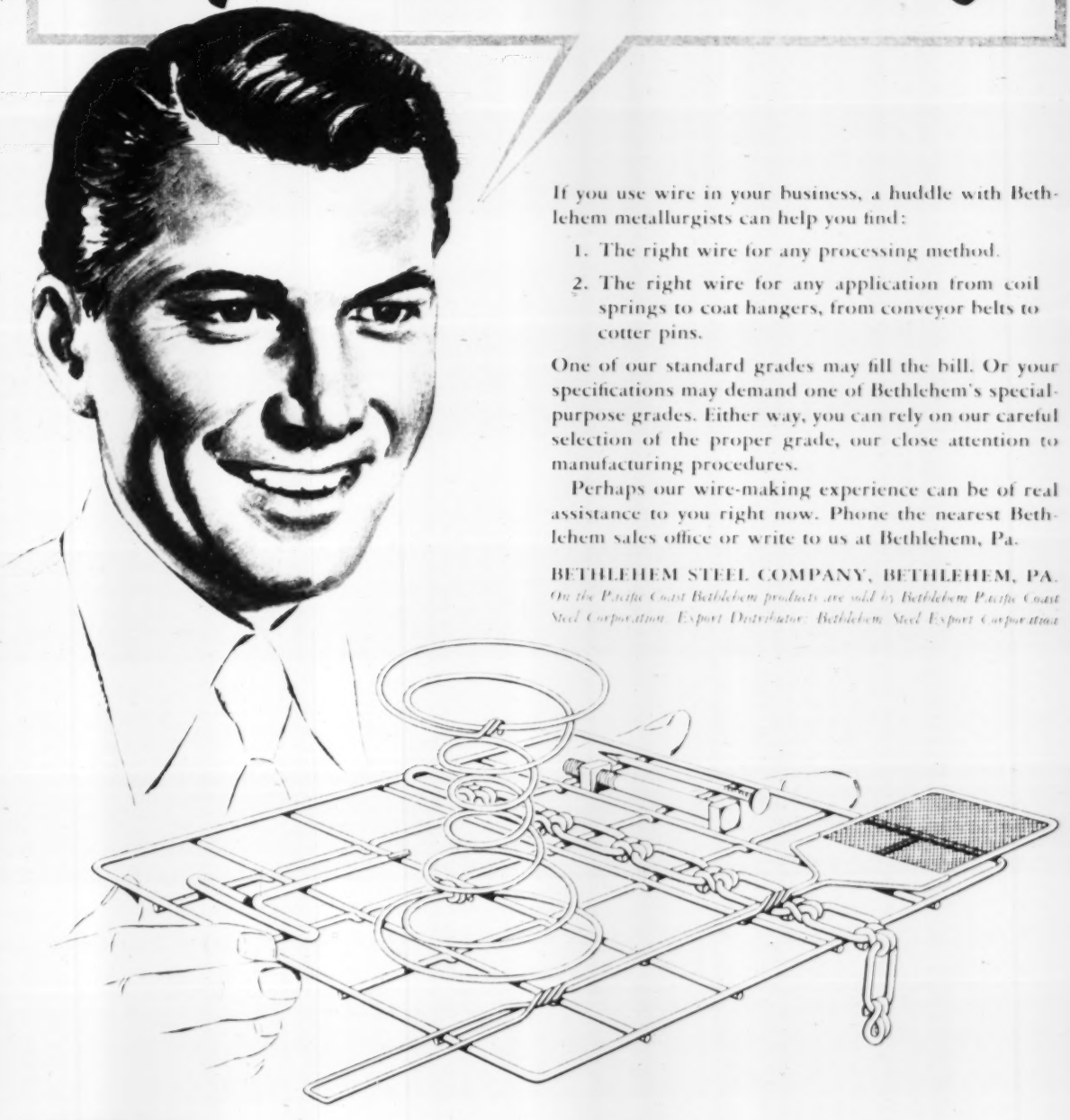
1. Cool contact operation—longer contact life.
2. Lengthened Arc Shield life—the LINE-ARC principle centers the arc, so that destructive burning is eliminated.
3. Safer electrical interlocks—double-break, coin-silver contacts. The moving normally-open and normally-closed contacts are insulated from each other.
4. Foremost accessibility for inspection and part-replacement—delays prevented because maintenance is encouraged.

It pays to specify EC&M Control

THE ELECTRIC CONTROLLER & MFG. CO.

2698 East 79th Street Cleveland 4, Ohio

Any Wire Problems?



If you use wire in your business, a huddle with Bethlehem metallurgists can help you find:

1. The right wire for any processing method.
2. The right wire for any application from coil springs to coat hangers, from conveyor belts to cotter pins.

One of our standard grades may fill the bill. Or your specifications may demand one of Bethlehem's special-purpose grades. Either way, you can rely on our careful selection of the proper grade, our close attention to manufacturing procedures.

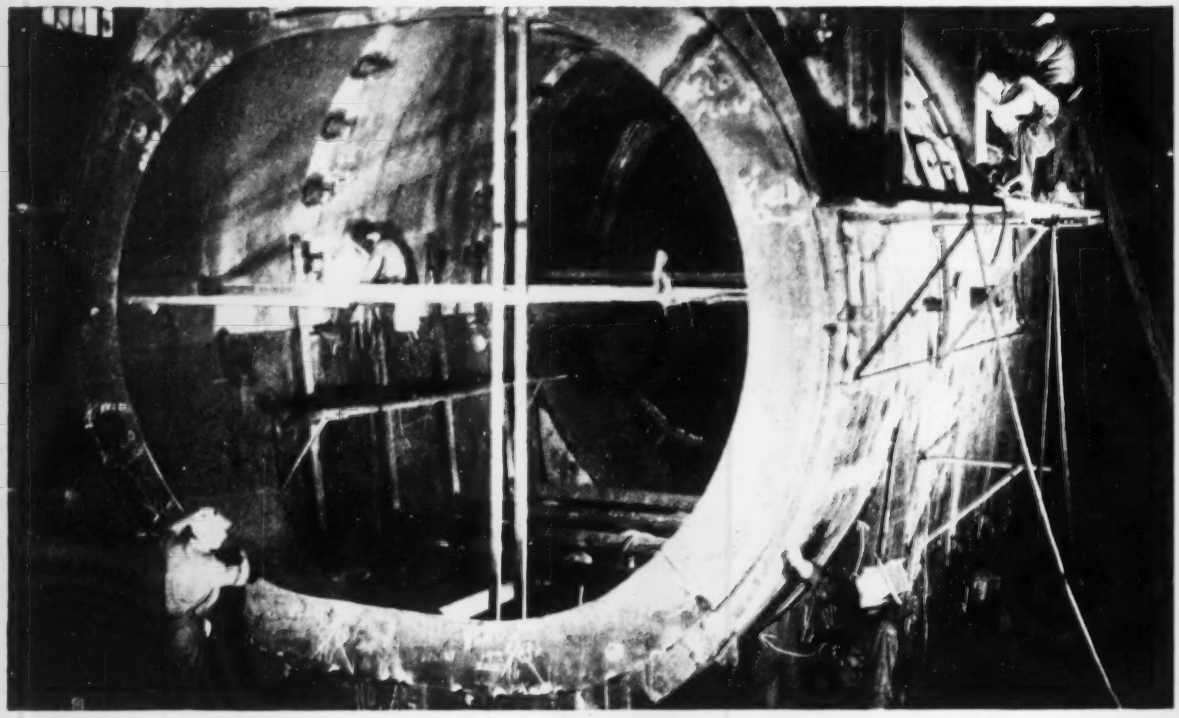
Perhaps our wire-making experience can be of real assistance to you right now. Phone the nearest Bethlehem sales office or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM WIRE



This formula helps an entire industry!

More and more firms in the chemical industry are coming to rely on this formula:

Barium Steel Corporation—best source for structural and steel plate, fabricated forms and finished products of steel, aluminum, magnesium, Fiberglas, plastics.

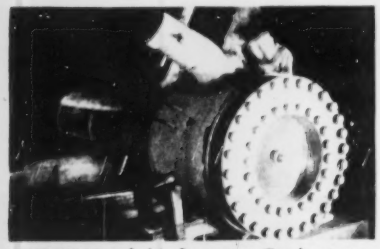
The reason for this conviction is that the group of strategically located companies comprising Barium Steel Corporation serves the chemical industry as a *unified* source for its structural and equipment requirements, controlling quality from blast furnace to end product, working as a self-contained supplier of urgently needed material.

For example, in the scene above, workers at Barium's Central Iron and Steel Company are building a giant condenser shell from Central plate, which is also fabricated into tanks, heat exchangers and piping for the process industries. Other Barium subsidiaries (see photos below) supply the chemical field with a number of important components.

Whatever your industry, Barium can provide you with the same kind of service. For details, write Barium Steel Corporation, 25 Broad Street, New York City. No obligation.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. • WILEY MANUFACTURING CO.

3.5



THE HEAD of this Lummus Co. heat exchanger unit is securely fastened by bolts and studs specially made by Barium's Erie Bolt and Nut Co. Specialty studs for the industry are also produced by Barium's Bayonne Bolt Corp.

THIS INGOT in the blooming mill at Phoenix Iron and Steel Co. will ultimately become structural steel, which is widely used in the chemical industry for the construction of new processing equipment.

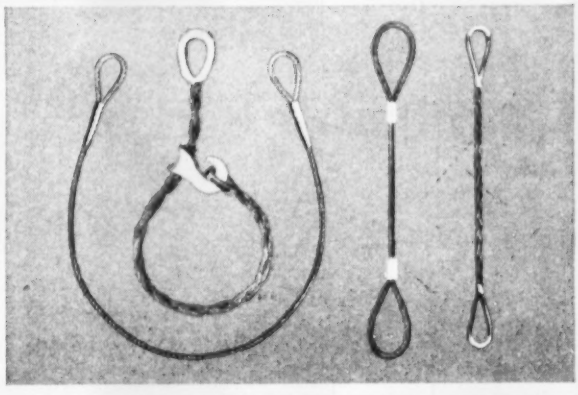
HEAT EXCHANGER manufacturers like Griscom-Russell Company take heavy forgings of Barium's Industrial Forge & Steel, Inc., and fabricate them into parts that resist temperature, high pressure, and the corrosive action of chemicals.

PREFORMED INTERNALLY LUBRICATED

Wire Rope

for cranes, hoists, elevators, and all equipment

From Macwhyte's complete line of a thousand and one sizes and types, you get the right rope for your equipment. Thoroughly lubricated, PREformed, engineered to give long, low-cost service. *Send for Catalog G-15.*

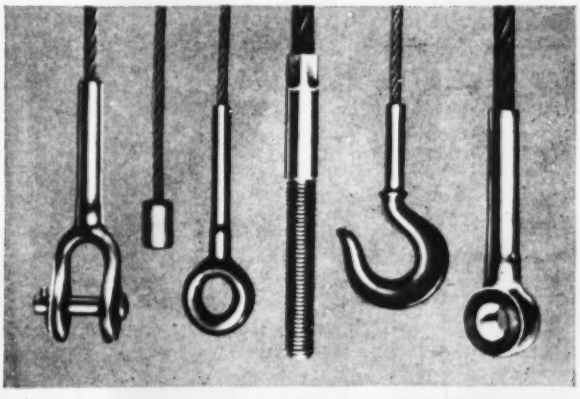


WIRE ROPE

Slings

for lifting and moving materials, equipment in production or maintenance

There are hundreds of types and sizes of Macwhyte Round-Braided, Flat-Braided, Single-Part, and Grommet Slings. All are custom made in length, capacity, and flexibility to meet your needs. *Send for Catalog S-8.*



WIRE ROPE

Assemblies

for machine parts, controls, and operating devices

Macwhyte Safe-Lock wire rope assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. There are many standard types. *Send for Catalog 5201.*

MACWHYTE

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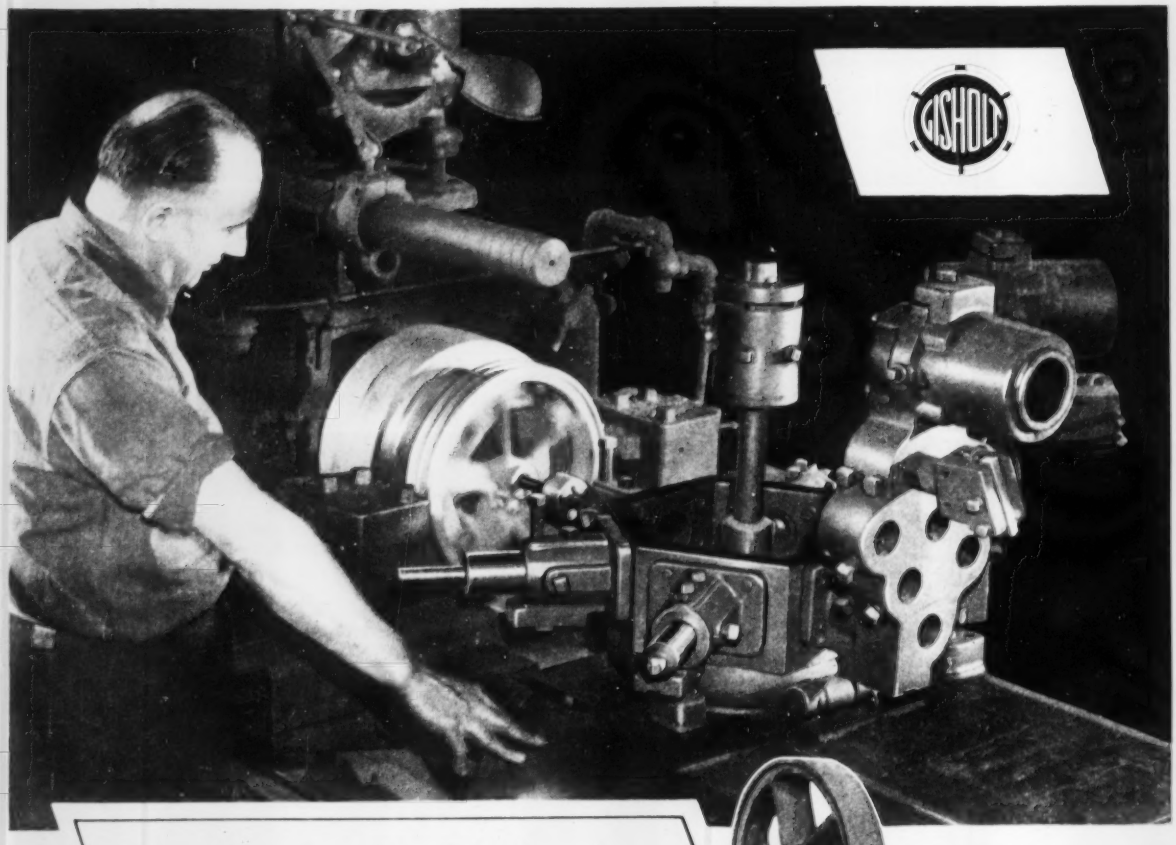


Production Trebled by the *FASTERMATIC!*

Rough Casting

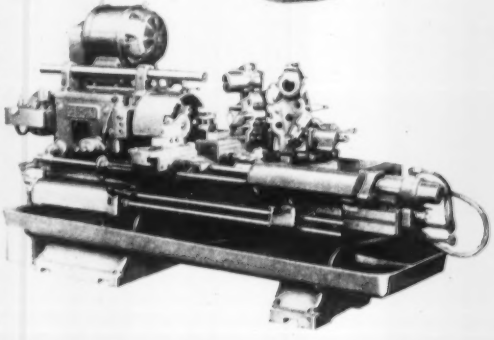
Finished Sheave

Note here the rather simple tooling arrangement for machining cast iron sheaves. This setup, similar to regular turret lathe work, is made just as easily. But here, the machine performs 15 different operations—holds tolerances consistently—completes the entire machining job in 14 minutes. The former time was 59 minutes.

Completely Automatic Cycle

It's the swift, automatic cycle of the Fastermatic that accounts for such substantial time savings. With its hydraulic feed system and automatic speed control, the operator has only to load the chuck, start the machine and remove the finished work. Usually, the operator has time to tend a second machine.

Now, when you need still greater production, it is a good time to look into the Fastermatics. Write for the Fastermatic catalog.



The Fastermatics are universal automatic turret lathes. Designed for accurate, high production turning, they can also be economically used on comparatively small lot work.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

This Week in Metalworking

STEEL

Vol. 132 No. 8 Feb. 23, 1953

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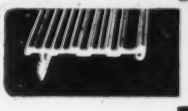

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Structural Shapes, Rods, Bars, Tubing

If your production requirements call for a specially-designed aluminum extrusion, the skill and experience of PE design engineers and production men are available to you to help answer your specific needs. Or, it may be that a solution to your requirements can be found among the 4000 standard rods, bars, shapes, and tubing currently cataloged by Precision Extrusions and available without additional die service charge.

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Behind the Scenes...

Mechanized

Automation and mechanization aren't an industry exclusive, as this wide-eyed report from one of our New York editors bears out: "Arrived at place of afternoon appointment five minutes ahead of time. Saw sign '3 Minute Shine,' investigated. Shine completed 2 minutes, 10 seconds. Reason: Battery of flexible shaft equipment beneath stands attached to brushes for buffing. Application of polish and final lick-and-promise with rag only hand operations necessary. Shine as good or better than normal type.

"Believe flexible shaft equipment and brush people missing fine potential market here. Spent next two minutes interviewing proprietor. Says equipment in use 16 years now, has several shops around city. Can be quoted as saying mechanization key to success but won't reveal annual sales or net worth; says he's not a candidate. Current problem is finding replacement brushes. Said I'd see what I could do. Made appointment on time."

Real Service

When Clark Bros. Co., Olean, N. Y., rolled out the carpet for machine tool editor Bob Huber recently, it turned out to be a flying carpet. One of the Clark planes flew down to Cleveland from Olean, picked up Bob and whisked him off to Olean.

The next day after a busy time at the plant the plane left with Robert aboard and made the hop back to Cleveland. According to his report, Bob must be about ready for his wings. He asked pilot Joe Decker enough questions about the plane that he should qualify for Editor in charge of Air Operations.

Teenage Slang Contest

Are you, by any chance, afflicted by the modern slang of a teenager in your happy home? Well, we are, and we'd like to start a little contest on just how corny you can get. As a starter, here's one that Ann tossed at us the other day when we said something that didn't seem to go over too well: *There's a fungus among us!*; says she and walks away while we stood there with a very silly expression on our puss.

The Perfect Squelch

Speaking of feeling silly, the little woman really put us in our place during Saturday morning breakfast. Apparently we'd been digging a little too hard for a compliment from the kids, and without looking up from the pancake griddle she said, "Say, do you remember what Adlai Stevenson said in one of his campaign speeches?" "No", said we, surprised that such an ardent Ike fan had even listened to any of Mr. S's comments last fall. "Well," she quips, "he said that *flattery* was perfectly harmless as long as you don't *inhale!*" And that sort of ended that.

Special Report For Management

Floyd Lawrence, STEEL's new Detroit editor, just finished what he describes as the "assignment of assignments". Keep moving east from here and you'll find the results of that assignment in the form of an eight-page special report on community and public relations. "I interviewed people who spend half their lives arranging interviews for other people", says Floyd, "and how they loved to have the tables turned and be interviewed themselves for a change!" He's talking, of course, about the public relations experts he saw across the country while he was soliciting their opinions on how metalworking companies can do a better job of communicating with the public at large. STEEL's article is a summary of what these experts think about a big subject, and if you are interested in reprints they are available through the Readers Service Department with our compliments. This is the first of a series of special reports which will comprise a Program for Management during 1953. The next one will be on government-industry relations and is scheduled for late March.

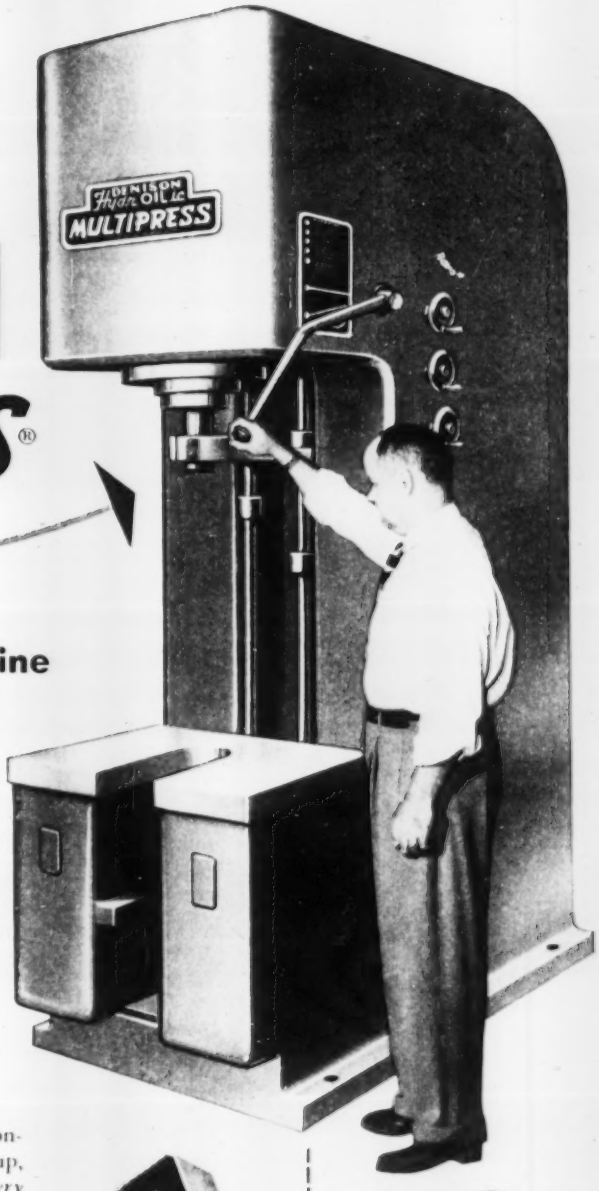
Shrdlu

(Metalworking Outlook—Page 37)

NOW

75-TON MULTIPRESS®

MODEL QA75



Big-job Multipress added to line

NOW — *all production-boosting Multipress advantages can be applied to jobs calling for pressures up through the 75-ton range!*

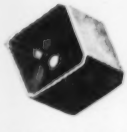
MANUAL OR AUTOMATIC CONTROL: A choice of nine control valves offers manual or automatic operation to suit any need. Dual-push button or hand-lever controls available for extra safety. Hold down and other operating sequences are easily provided.

VERSATILE RAM ACTION: The 15-inch maximum ram stroke of the new 75-ton Multipress is fully adjustable for both upper and lower limits. Pressing and approach speeds are *independently* adjustable. Continuous cycling of automatically controlled ram may be set for either distance or pressure limits.

TOUCH CONTROL: With the New Multipress servo control added, the ram starts, stops, reverses, speeds up, slows down, or applies pressure *in direct relation to every action on the hand lever.*

INDEX TABLE FEEDS AND OTHER ACCESSORIES: Six- and 12-station Multipress Index Tables can be used for fast, automatic, multiple-point feeding or assembly of parts. Many other automatic feeds, auxiliary attachments and work-speeding accessories also available.

The 75-ton Multipress has a 30-inch daylight opening (gap) . . . 34-inch work table width . . . 13-inch throat depth. Height, only 106 inches. *Write* today for full details on this versatile, big-job Multipress. *Other sizes and capacities from one to 50 tons.*



After switching to Multipress, only three draws were needed to form heavy phosphor bronze housings that required six operations by the former method.

With each ram stroke, Multipress puts 120 close tolerance notches around a thin walled compass bezel. Averaging 800 per hour, rejects dropped to .0025%.

With quick, accurate one shot assembly of this 6 part metal and plastic switch component, Multipress boosted output 80% and cut scrap loss 84%.

Multipress increased production speed to 3½ times the previous rate in staking metal pins in a precision part of a famous make 3 speed record changer.

DENISON Hydr OIL ics

The DENISON Engineering Company 1163 Dublin Road, Columbus 16, Ohio

HOW THE SLAYSMAN COMPANY REDUCED THREADING TIME BY 97%

The Slaysman Company, a large machine shop and parts sub-contractor in Baltimore, reduced threading time on one contract operation from 2 hours to 4 minutes by the installation of a LANDMACO Threading Machine.

This contract required the cutting of a 1" diameter 5 pitch Acme thread 29" long on C1141 steel to a Class 3 fit. Original production plans were to generate the thread by milling. At the same time, even though the specifications and the hardness of the material seemed to preclude other methods, we were asked if we could suggest a more efficient threading process.

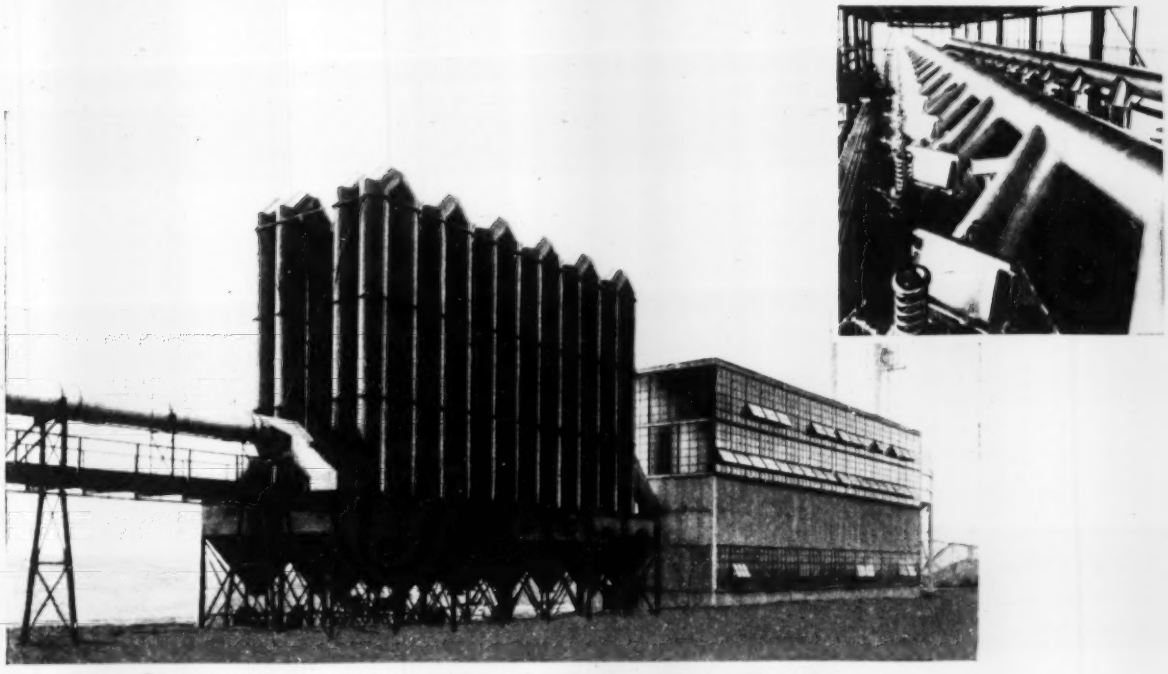
Based on our recommendation after studying the thread specifications, a 1½" LANDMACO Single Head Leadscrew Machine with an extra-long carriage was installed. The LANCO threading head was equipped with centering throat chasers with a roughing and finishing thread form. Centering throat chasers produce threads concentric with the outside diameter, and eliminate the out-of-round condition that often occurs when threading extra-long workpieces. The roughing and finishing thread form chasers cut coarse pitch threads with excellent finish in one pass.

Not only did this method reduce threading time from 2 hours to 4 minutes, but it also produced a very economical 50 pieces between chaser grinds. This is particularly impressive when it is remembered that the thread was 29 inches long and the hardness of the material threaded was near the limits of machineability.

Many other LANDIS machines are every day making significant savings producing all types of threads. Perhaps we may help you make similar economies in your thread production.

LANDIS

THE LANDIS *Machine* CO. 50TH ANNIVERSARY WAYNESBORO PENNSYLVANIA



Giant gas cooler is special feature of Dracco Dust Control system at smelting plant. 36 Dustomatic Filters (inset) are housed in building (right).

IS YOUR DUST PROBLEM ANY TOUGHER THAN THIS?

Dust recovery in the smelting business is difficult. Complicating factors such as high temperatures and severe conditions demand specialized engineering and equipment.

Consider the problem Dracco undertook at a large secondary smelter in Chicago, Illinois. Secondary smelting operations produce gaseous fumes at 2200° F. containing a valuable product, zinc oxide. Without efficient product recovery, the sub-micron size particles are lost in exhaust to the atmosphere. Dracco's job: recover the zinc oxide economically and efficiently.

Application engineering by Dracco furnished the answer. First, the gas temperature is reduced to normal filtering temperature by specially designed water coolers, stainless steel lines and a giant U-tube cooler. Then, the 36-unit Dustomatic Filter system collects all zinc oxide automatically and continuously. This Dracco installation has proved highly efficient and profitable.

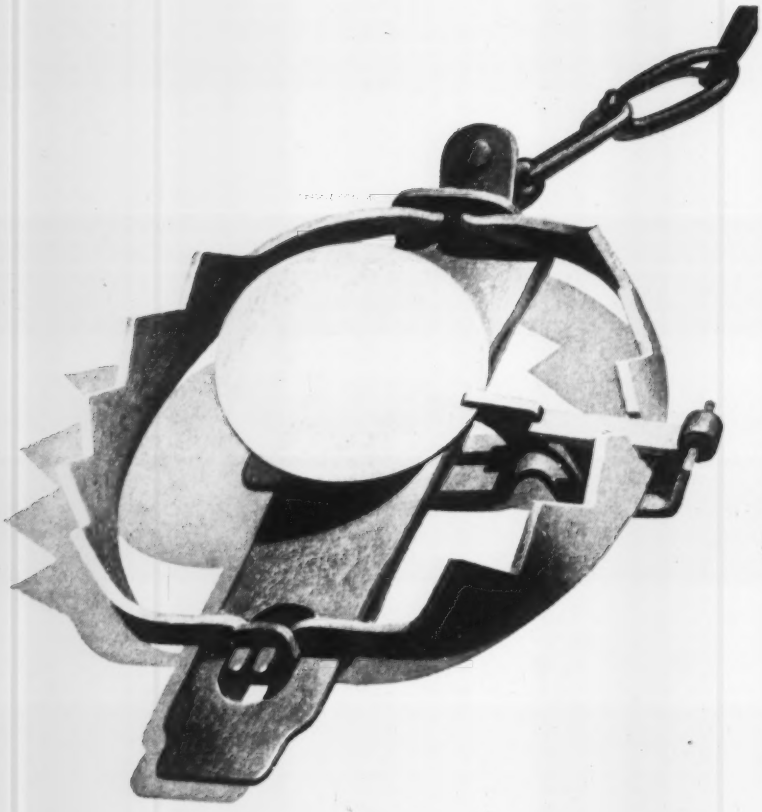
Dracco Engineers with a broad background of experience in solving industrial dust problems are constantly at your service. If you have a tough problem in the control or recovery of dust, call in Dracco.

DRACCO CORPORATION
4090 East 116th Street, Cleveland 5, Ohio

"Industrial Dust Control and Recovery" is the title of a new Dracco bulletin. Write for your copy today.

DRACCO *Performance Proved*

Airstream CONVEYORS · DUST CONTROL EQUIPMENT



All over your building, fire sets its traps. In dip tanks, transformer vaults, storage spaces. In fact, wherever it can stop your business in its tracks. Make sure you don't fall victim. Post a KIDDE Portable Extinguisher next to every fire hazard.

Kidde

Walter Kidde & Company, Inc.,

260 Main Street, Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

LETTERS TO THE EDITORS

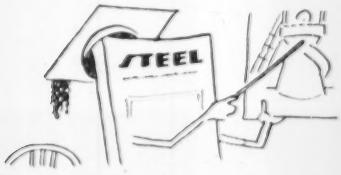
Reprints Are Still Available

We are sorry to note that the "1953 Metalworking Yearbook" of STEEL is sold out. If you could let us have reprints of whatever sections you have of this excellently edited yearbook, this would be very much appreciated.

H. Kerr
American Saar Steel Corp.
New York

• *Sent are copies of the "1953 Facts and Figures," "What Management Expects in 1953" and "Now Is the Time." There are copies of Facts and Figures and What Management Expects still available from our Reader's Service Department.—ED.*

Blast Furnace Series Still Hot



Enclosed find my check, for which please send me the report which you have entitled "Blast Furnace Practice."

D. S. Eppelsheimer
Department of Metallurgical Engineering
School of Mines & Metallurgy
Rolla, Mo.

. . . please send one copy of "Blast Furnace Practice" by Charles E. Agnew.

F. K. Landgraf Jr.
Republic Steel Corp.
Cleveland

. . . it would be appreciated if you would send us this series.

C. G. Botham
Senior Investigating & Knall
Birmingham

• *Sent.—ED.*

Titanium Know-How Wanted

I would appreciate receiving a reprint of the article "Titanium Forging Experience Mounts" by R. J. Bullock (Dec. 15, 1952, p. 104).

L. Schlossberg
director metals research
Quaker Chemical Products Corp.
Conshohocken, Pa.

• *Sent.—ED.*

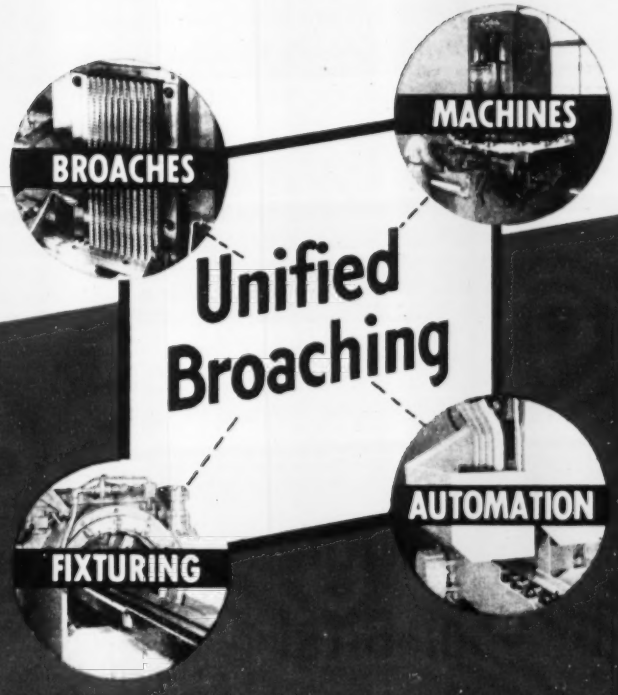
Credit Where It's Due

Your article titled "Volume Plating Method Increases Gun Tube Life" (Nov. 17, p. 89) disturbs us. You err both in fact and by implication.

General Motors Corp. at Oldsmobile is undoubtedly doing a fine job of gun plating, but you give them undeserved credit and for the following reasons:

1. The Van der Horst Corp. was mass producing the gun tubes referred to before General Motors. As a matter of interest, the first pilot plant for evolving the necessary technique is still in

Continued on following page



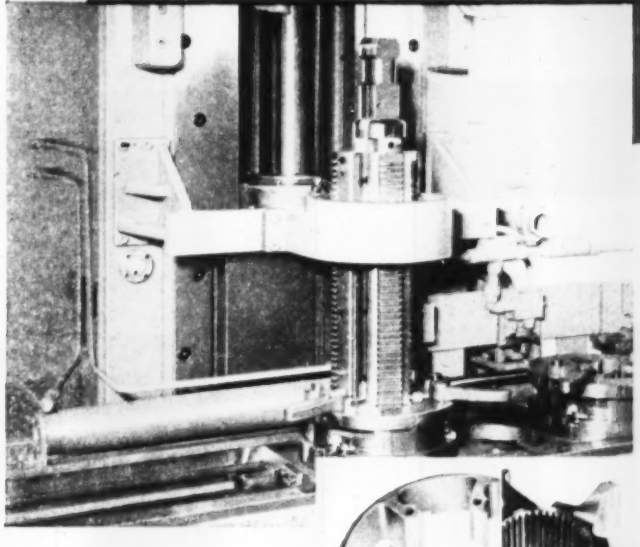
The New Trend...

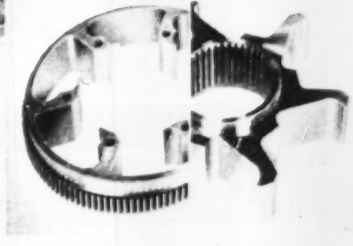
the COLONIAL method

At Colonial, experience, imagination and competence are applied

1 **to the design and manufacture of each of the individual components of a complete broaching installation, and**

2 **to the effective combining of ALL components into a completely UNIFIED BROACHING installation—making them work as a "team."**





3 Colonials Broach Intricate Aero Parts

Three Colonial broaching machines rough and finish broach these two mating aircraft engine parts. Six internal contours on the body are broached on a 15-ton Model RD pull-down (illustrated). The spider's external contours are broached on a Model RS 6-ton single ram and internal involute splines on a 15-ton Model RD pull-down machine.

Machines, broaches, fixtures, etc., were all designed by Colonial as a UNIFIED BROACHING INSTALLATION.

WHAT'S AHEAD IN BROACHING?

Keep up with the latest developments: Read "Broaching News". We will be glad to see you get it regularly if you will drop us a line on your company letterhead.

PIONEERS OF H.S.S. BROACHING

COLONIAL BROACH CO. DETROIT 13

HEAVIER CUTS IN HARDER MATERIALS AT HIGHER SPEEDS

Get More Production with GORHAM "M-40-B" Tool Bits!

Get more out of your machine tools . . . raise your production curve . . . with Gorham "M-40-B" turning tools! Use "M-40-B" wherever the application of a Super High Speed Steel is indicated, as in machining heat treated alloy steels with large amounts of stock removal at high surface speeds.

"M-40-B" is a Super Moly grade with performance characteristics comparable to those of super tungsten high speed steel. It has extremely high red hardness, high Rockwell hardness, and offers maximum toughness and abrasion resistance. You can take heavy roughing cuts with it at high surface speeds and feeds . . . use it for high speed finish cuts as well.

"M-40-B" comes in square tool bits, 11 stock sizes, and in 23 stock sizes of rectangular turning tools. Bits and turning tools are accurately ground, uniformly hardened, ready to sharpen. Special sizes and shapes to your order. Illustrated with prices are three popular size "M-40-B" tool bits. See your distributor, or send direct for a trial order.

"M-40-B" is one of three cutting tool materials developed by Gorham. Others are Gorham "Standard", for the commercial field, and "Gormet", for turning soft or abrasive stock. They're completely described, with size and price lists, in a new free bulletin. Send for your copy today.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from preceding page

existence here at one of our Olean plants.

2. The plating fixture you show and the "accurately fitted anode" you mention are all of Van der Horst design. In the spirit of co-operation, we shared these items with Oldsmobile. So, General Motors started from scratch. Their scratching really would have been tough if Van der Horst had not developed the technique of fixturing.

William J. Fritton
vice president & sales manager
Van der Horst Corp. of America
Olean, N. Y.

Up Draft in Air Trends

Will you kindly let us know where we can obtain a copy of *Air Cargo Trends* by L. R. Hackney and C. J. Rausch of Lockheed Aircraft Corp., referred to in your article "Air Freight Flies High" (Dec. 29, p. 46).

F. A. Vossenberg
assistant managing director
Research & Development Division
Yale & Towne Mfg. Co.
Philadelphia

• *Write directly to Lockheed Aircraft Corp., Burbank, Calif.—ED.*

Shooting At Safety

In the Jan. 12 issue of STEEL, there's a Production and Engineering News item under the title "Shooting Demonstration" (p. 65) which interests us very much.

We'd like to know what division of General Electric Co. is making this type of demonstration. It is our desire to use such a program as part of our forthcoming safety conference in this area.

Paul E. Wilson
director
Middletown Safety Council
Middletown, O.

• *Write to C. T. Walker, News Bureau, General Electric Co., Schenectady 5, N. Y.—ED.*

Machine Is 'Tractor-Type'

On p. 90 of the Dec. 22, 1952 issue of STEEL, there appears a notice regarding our "Caterpuller" Pull-Out. We feel that the title of the paragraph "Track-Type Pull-Out" is slightly inaccurate as well as misleading. It should have been "Tractor-Type Pull-Out."

R. E. Hazard
James L. Entwistle Co.
Providence, R. I.

Follow Up on a Survey

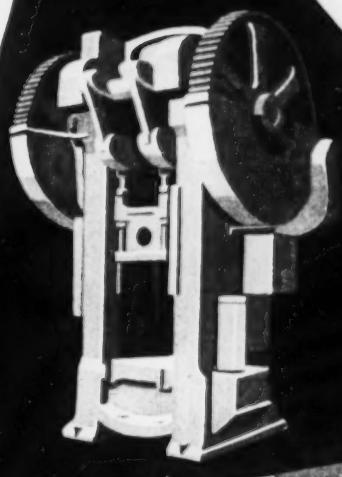
In the Nov. 10 issue of STEEL (p. 139) you refer to a survey on materials handling recently published by the consulting engineering firm of Wheeler-Brady Inc., Cleveland.

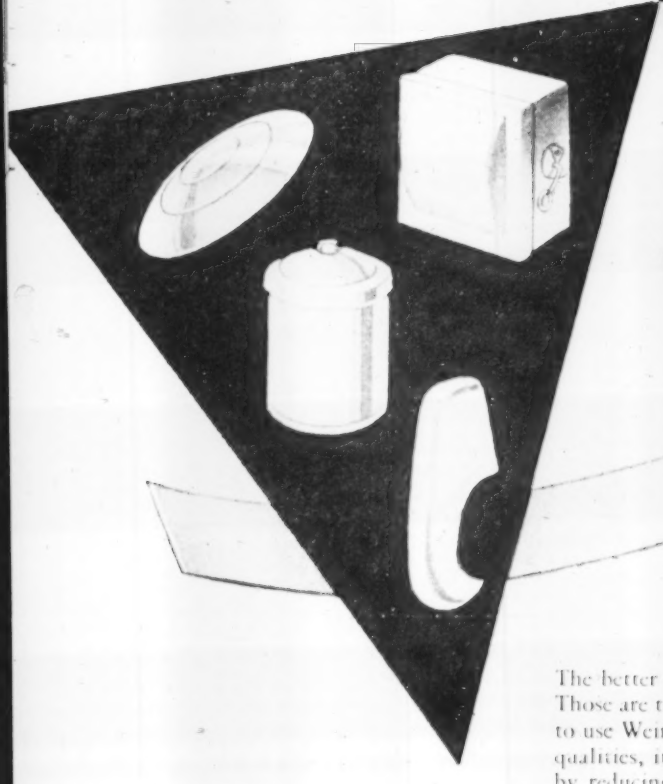
We are interested in obtaining a copy of this survey and would like the full address of Wheeler-Brady.

Edward Leto
Hewitt-Robins Inc.
Stamford, Conn.

• *The address is Wheeler-Brady Inc., 15017 Detroit Ave., Cleveland.—ED.*

for better output-





WEIRTON
STRIP STEEL

The better the strip, the better the product—and the easier production. Those are two important reasons why manufacturers find it advantageous to use Weirton cold-rolled strip steel. Its excellent drawing and forming qualities, its constant uniformity, promote plant efficiency and economy by reducing spoilage and tool expense. In short—Weirton strip boosts both quantity and quality.

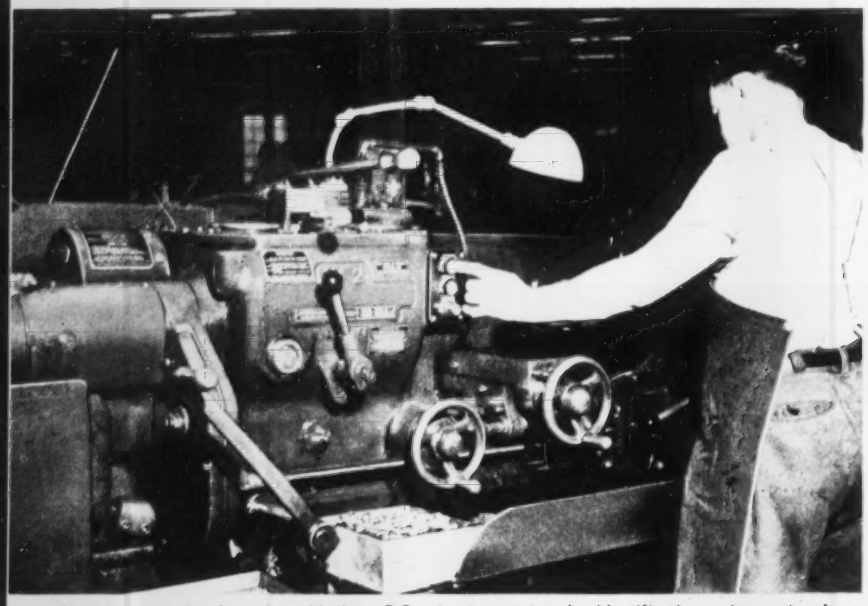
WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

GENERAL-PURPOSE CONTROL

Fhp motor starter
1 7½ hp manual motor starters
A c magnetic motor starter
Combination motor starter
Reversing motor starter

New G-E Oil-tight Units — Modern Design for Modern Machines



Machine operation is easier with these G-E units that retain color identification under continual use

An entirely new concept of push-button design means greater flexibility, easier installation, and longer life of these units on your machines.

VARIETY OF FORMS AVAILABLE

Interchangeable rings are available in five colors—will fit both push-button and selector switch forms. No need to order complete units to get a special color. Operators are available with extra long button, mushroom head, locking attachment, cylinder lock, and in combination units in addition to the standard push-button and selector switch forms.

One basic form of contact block fits these operators; is attached by means of two screws. You save time and money in ordering or making up the forms you need.

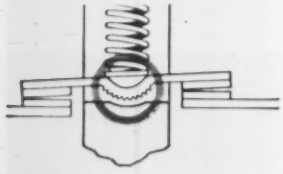
COMPACT ENCLOSURES

In stations or enclosures these units are back mounted—simplifying wiring, and making a neat arrangement. Stations designed in accordance with JIC specifications are of strong, lightweight cast aluminum with a Buna-N gasket to keep out oil, water, and coolant.

BUILDING BLOCK CONSTRUCTION:

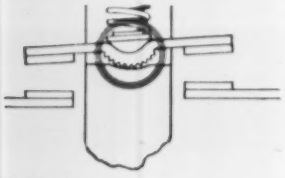
The same basic contact block is used on all push-buttons and selector switches. Double-pole, double-throw combinations are made by mounting two blocks on the same base. Tandem combinations with four contact blocks are easily made up by using an adapter plate. Write for Bulletin GEA-5779. *General Electric Company, Schenectady, N. Y.*

G-E SELF-A-LINE CONTACTS



ON MAKE:

When stationary contacts are misaligned movable contacts align with them.



ON BREAK:

Contacts always break evenly regardless of any misalignment of stationary contacts.

Wear is distributed evenly over both contact surfaces. Result: a 2:1 increase in life—by actual load-life tests.

LONG ELECTRICAL LIFE:

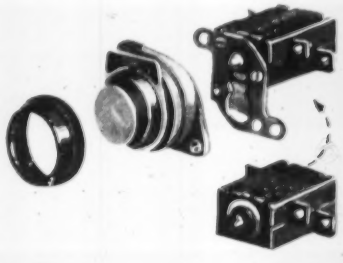
Unique self-a-line contacts assure equal distribution of arcing on the double-break contacts which prevents excessive and cumulative burning of the tips. Wipe on both normally open and normally closed contacts prevents false operation under vibration. Arc-resistant melamine contact block has long life.

ATTRACTIVE, BUT PRACTICAL:

Color stays clean and bright because it's anodized in the ring, and around the button away from area of use. Color coding can be seen from the side as well as the front. Smooth, rounded contour blends with modern machine design. Standard or extra-large nameplates available for all forms.

EASILY INSTALLED:

Contact blocks, operators and color rings can be assembled with little effort. Wiring is simple. Large pan-head No. 8 screws with terminal clamps easily take No. 12 wire and cannot be twisted off when tightened. Screw will also take solderless-type lugs. Only normal hand tightening is required to make unit oil-tight because of a special washer.



Inventory is reduced with these G-E units that have interchangeable color rings, separable operators, and one basic form of contact block.

INFORMATION FOR PRODUCTION AND MAINTENANCE

Reduced voltage starter

Heavy and standard-duty push-button stations

General-purpose relay

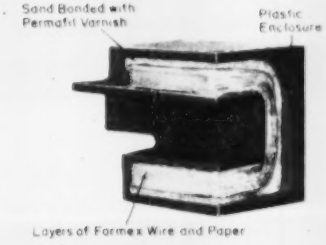
A-c and d-c solenoids

Roller-lever type limit switch

Rotating-type limit switch

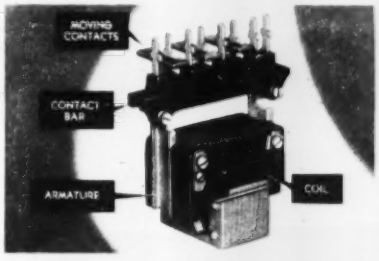
STRONGBOX COIL MEANS EXTRA LONG LIFE FOR G-E MAGNETIC MOTOR STARTERS

This unique plastic-encased coil resists moisture, dust, and oil—cannot be damaged by a slipping screwdriver during wiring and installation. Permafil* varnish, which does not liquefy in heat, prevents windings of Formex* magnet wire from abrasion under vibration and is sealed under vacuum so no "hot spots" can develop.



G-E Strongbox magnet coil has windings encased in molded plastic to prevent damage from vibration, moisture, dust, and screwdrivers.

The grooved sides of the plastic enclosure serve as guides to the moving magnet armature. A lubricant impregnated in the block reduces friction for fast, easy action at all times. There is no rubbing of metal against metal, so wear is reduced. Positive "make" and "break".



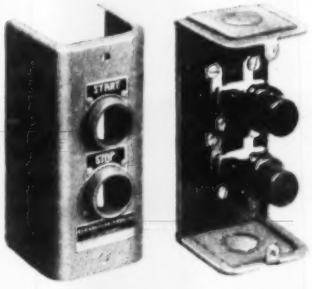
Coil acts as permanently lubricated guide to moving magnet. No metal-to-metal friction.

*Reg. trade mark of General Electric Co.

Wiring is easy. When the screw is backed off to make room for insertion of the wire, the clamps and lockwasher follow the screw head.

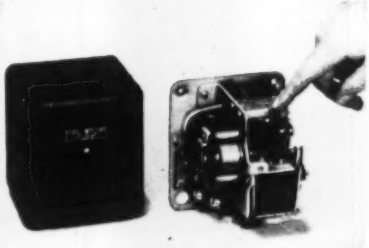
Coils are easily interchanged, come in ratings of 110, 220, 440, 550, and 600 volts. Simply remove four easy-to-reach screws, and the coil slips out over the stationary magnet. Design is simple, compact. Coil terminals are front-connected, clamp-type—solidly anchored in the plastic enclosure—will not twist loose when tightened on the wire.

Ask for the starter with the Strongbox coil—it's an exclusive feature of all G-E a-c full-voltage magnetic starters in NEMA Sizes 0 through 3 for one to 50 hp motors. Write for Bulletin GEC-880.



HEAVY-DUTY PUSH-BUTTON STATIONS ARE VIBRATION RESISTANT—LONG LIVED

Enclosed in a strong steel case, G-E heavy duty units have silver-tipped contacts with strong springs that stand up under constant vibration and use. Many combinations are possible with momentary and maintained-contact buttons, selector switches, and indicating lights. Terminals are large for easy wiring. Large buttons encircled by guard rings prevent accidental operation. Surface and flush-mounted stations available. Bulletin GEA-5043 describes all forms.

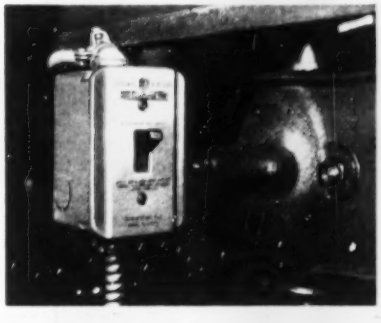


ACCURATE TIMING WITH THIS RELAY—STEPLESS ADJUSTMENT

For process timing this relay has a repeat accuracy of 0.5 per cent of maximum time setting. Four forms available for time ranges of 3 to 100 seconds up to 12 minutes to $6\frac{2}{3}$ hours. Synchronous motor driven. Switch has both an instantaneous and time open, time closed contact. For more information on this easily adjusted timing relay write for Bulletin GEC-600.

FRACTIONAL-HP MOTOR STARTERS HAVE EXTRA PROTECTION FEATURES

Bi-metallic overload relays take a variety of heater sizes—tab in operating handle quickly identifies rating. On overload, handle moves to OFF for position indication. Protection to contacts and overload relay is provided by a plastic enclosure within the steel case. The outer case has four $\frac{1}{2}$-inch and two combination knockouts for easy mounting. Write for Bulletin GEA-2234.



For more information contact your nearest G-E representative, agent, or distributor or write Section B 730-43, General Electric Co., Schenectady 5, N. Y.

GENERAL ELECTRIC

NOW you can

BRIGHT-ANNEAL STAINLESS

on a continuous production basis, with

The

SARGEANT & WILBUR

Controlled Atmosphere

CONVEYOR FURNACE

PARTS MADE OF STAINLESS can be

BRIGHT-ANNEALED,

BRIGHT-HARDENED, or

BRIGHT-BRAZED without oxidation . . . they come out scale-free, bright, and clean. No pickling required, no tumbling, no sand blasting.

With our special S. & W. alloy for bright-brazing stainless, the color matches the metal; resists dulling; and the joint is practically invisible. Gold and silver parts are soldered in the same continuous-production furnace with equal success.

Your samples processed free. If you want to see some of your own work bright-annealed, bright-hardened, or bright-brazed in a conveyor furnace, send us samples and specifications.

SARGEANT & WILBUR, INC.
180 Weeden St.
PAWTUCKET, R. I.

Send your illustrated folder "How to BRIGHT-ANNEAL STAINLESS in the S. & W. Conveyor Furnace."

Name

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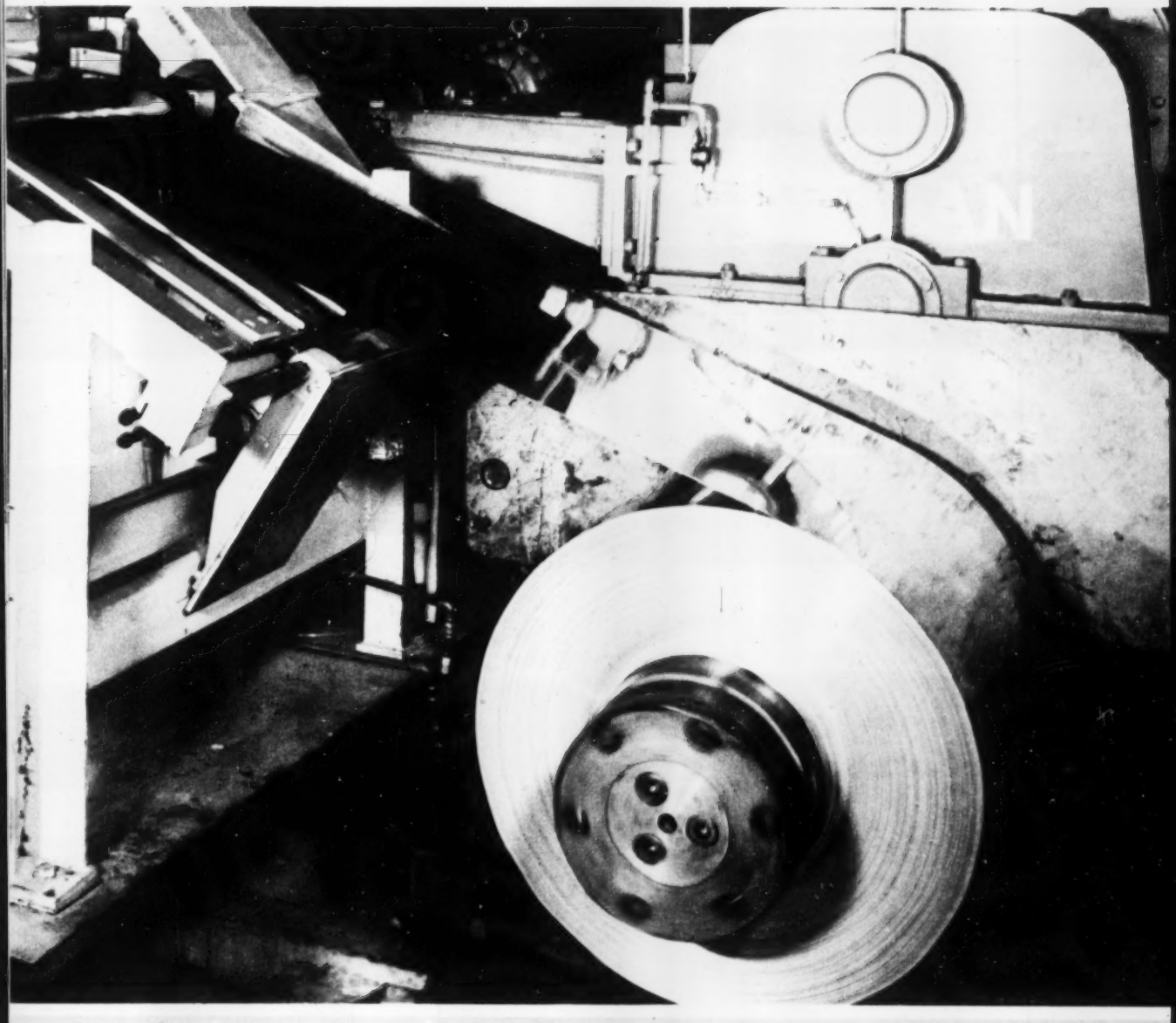
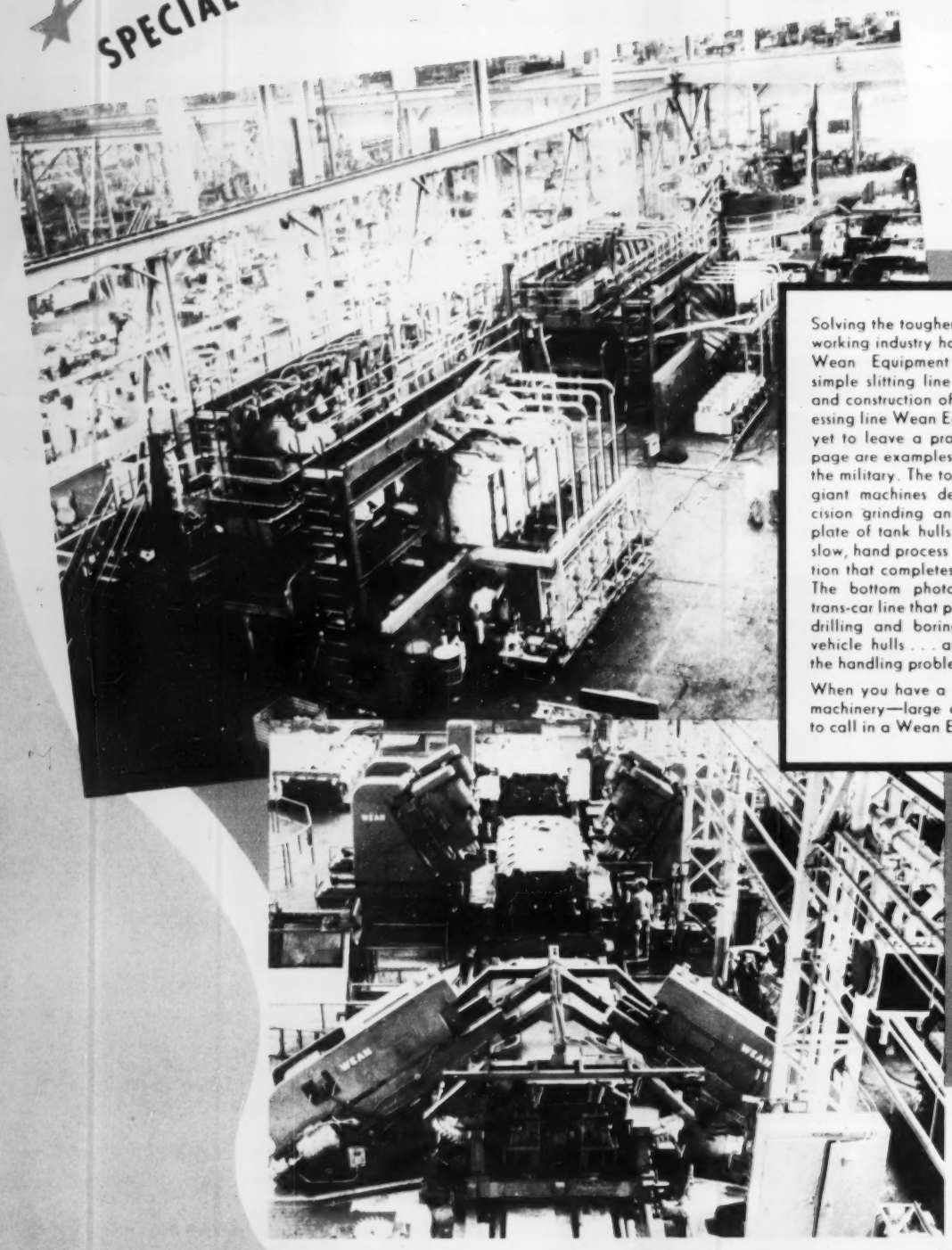
The Wean Engineering Company, Inc., Warren, Ohio is a recognized specialist in the design and installation of sheet, tin and strip mill equipment. The expert knowledge and trained imagination of one of the world's most noted steel mill engineering firms are at your service when you specify Wean — whether the job calls for a single piece of equipment or a complete design of an entire line.



Exit end of high speed tinning line.

The WEAN ENGINEERING COMPANY, Inc.
WARREN OHIO

SPECIAL METAL WORKING EQUIPMENT...



Solving the tougher problems for the metals working industry has become habit with the Wean Equipment Corporation. From a simple slitting line to the complete design and construction of a military vehicle processing line Wean Equipment engineers have yet to leave a problem unsolved. On this page are examples of recent Wean jobs for the military. The top photograph shows two giant machines designed to perform precision grinding and drilling on the armor plate of tank hulls. The machines turned a slow, hand process into a production operation that completes the job 22 times faster. The bottom photograph is of a unique trans-car line that performs precision milling, drilling and boring operations on heavy vehicle hulls . . . at the same time solving the handling problem of these bulky pieces.

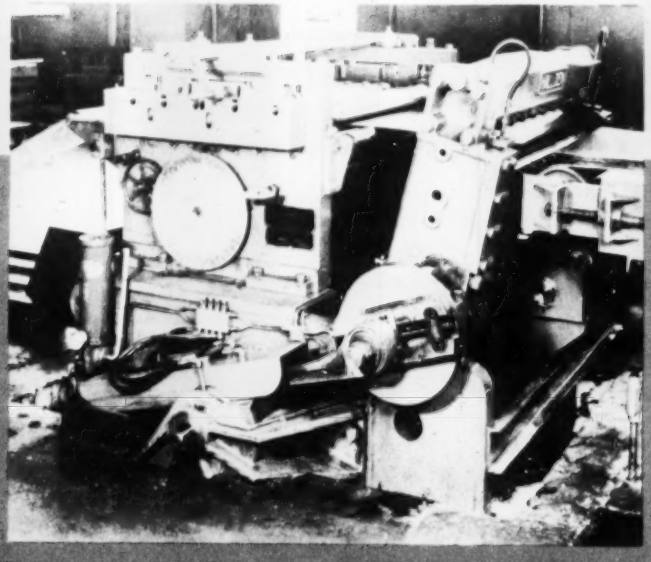
When you have a job that requires special machinery—large or small—you'll be wise to call in a Wean Equipment engineer.

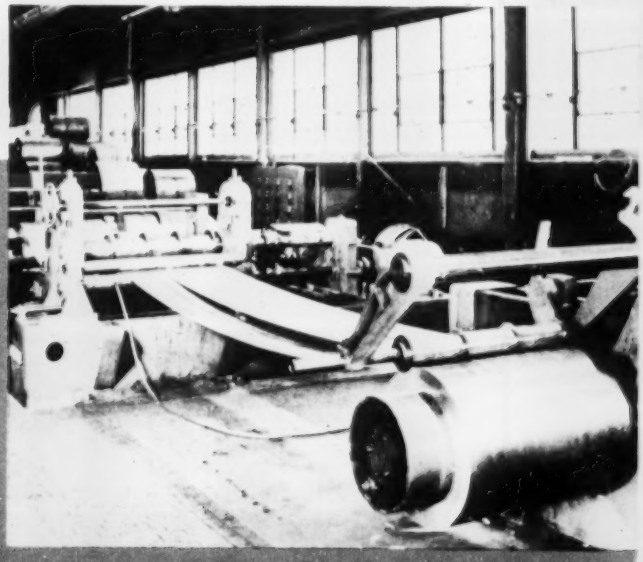
MACHINERY TODAY IS THE BUSINESS OF THE

Wean EQUIPMENT CORPORATION

Cleveland, Ohio

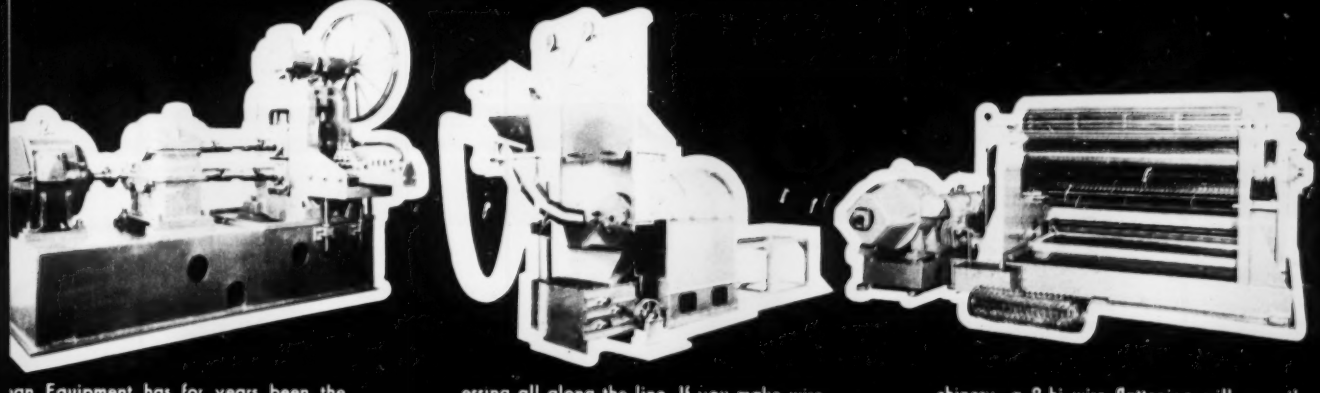
WEAN ADVANCED SLITTING and FLYING SHEAR LINE...



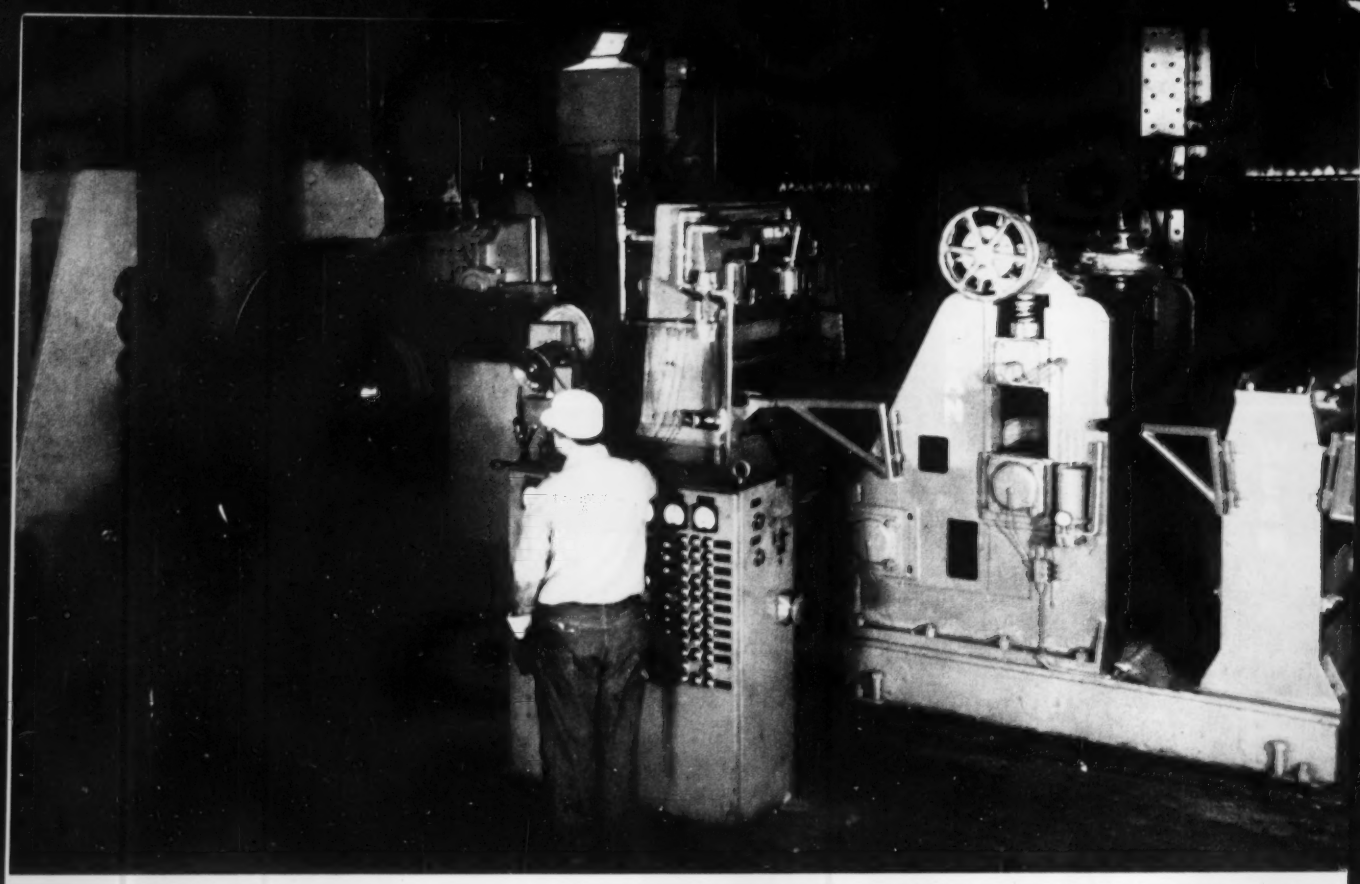


Here's the most advanced flying shear line marketed today. A line that can save you up to 20 per cent on your steel costs because it can make 100 cuts-per-minute to resquared tolerances. If you are a user of sheet steel it will more than pay you to get in touch with a Wean Equipment engineer and have him prove to you how you can order your steel direct from the mill, in coil form, eliminate expensive extras, and make a saving amounting to almost $20 per ton in your final steel costs. You can't afford to overlook this amazing new line . . . get in touch with Wean Equipment in Cleveland, Chicago or Detroit.

WEAN WIRE MACHINERY



ean Equipment has for years been the jor producer of wire machinery, and has "know-how" to design and build ma- es to speed wire production and proc- essing all along the line. If you make wire or wire products you should know the Wean Equipment man in your area. Products pictured here are typical of Wean wire machinery; a 2-hi wire flattening mill, a nail galvanizing unit, and a hexagon netting machine that holds all records for the manufacture of this popular wire product.



Wean high speed electrolytic cleaning line.

WEAN ENGINEERING Company, Inc.
WARREN, OHIO

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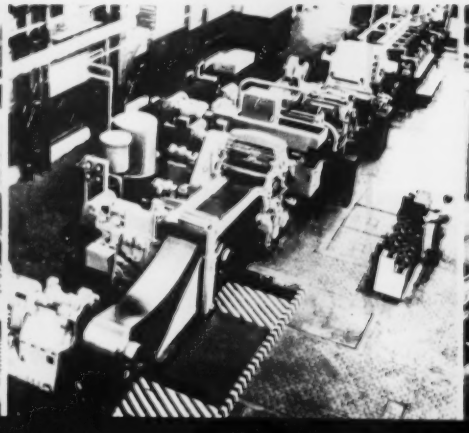
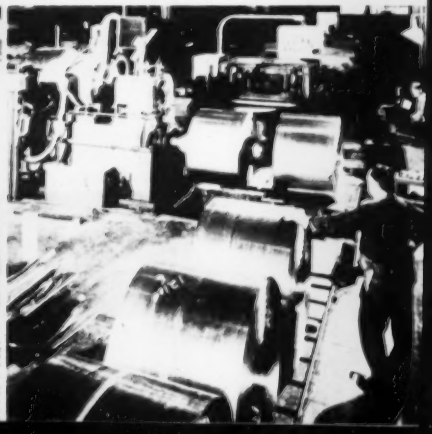
Continuous strip pickle line

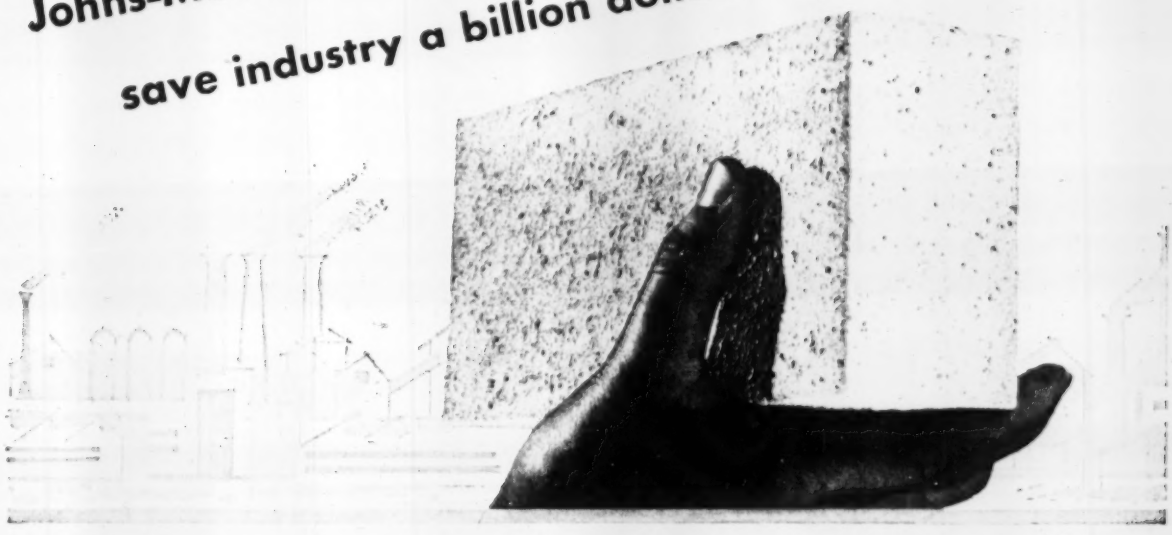
Continuous electrolytic cleaning line



Continuous coating line



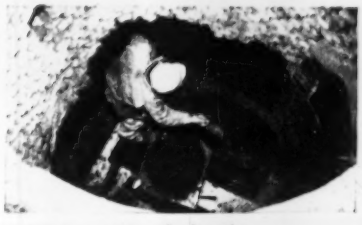
Johns-Manville Insulations save industry a billion dollars in fuel every year!



Reduce your fuel costs and build better furnace linings with JM-3000 INSULATING FIRE BRICK

HERE'S THE ONLY insulating fire brick that withstands a full 3000F. It's highly efficient both as an exposed refractory lining or as back-up insulation. And JM-3000 is only one of six types of Johns-Manville Insulating Fire Brick made for these applications. All provide long-life insulation. All are light in weight, have low conductivity, high structural strength. These properties permit thinner furnace walls—yet you can achieve important fuel savings and increased production, because J-M Insulating Fire Brick assures quick furnace response.

Sil-O-Cel* Insulating Brick is another outstanding J-M fuel-saver . . . a high load-bearing brick for back-up insulation behind refractory linings. It comes in three types, for service through 2500F—makes it possible to reduce the necessary thickness of refractory linings as much as one-third.



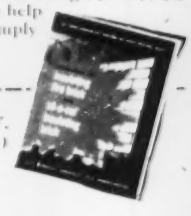
Save fuel with J-M Hydraulic Setting Refractories

Johns-Manville refractories meet every need for castable, troweling and gunning applications for temperatures through 3000F. *Firecrete** is used to cast special shapes of all kinds. It is ready for use within 24 hours, has negligible shrinkage and high resistance to spalling. *Blazecrete** is used to build and repair furnace linings. When gunned, it adheres readily with a minimum of rebound loss. When slap-troweled, it eliminates laborious ramming and tamping.

Save Fuel with J-M Aggregates and Fills

These lightweight insulations are used as fills to conserve heat in irregular spaces where other forms of insulations cannot be economically applied. They are also used as aggregates for mixing with other materials to form insulating refractory concrete.

Send for your free copy! This new booklet IN-115A gives full details about J-M insulating materials for service through 3000F. To find out how they can help cut your fuel costs, simply mail coupon.



JOHNS-MANVILLE PRODUCTS

Johns-Manville
FIRST IN INSULATION

Johns-Manville, Box 60, N. Y. 16, N. Y.
(In Canada, 199 Bay St., Toronto 1, Ont.)
Please send me, without charge, copy of brochure IN-115A

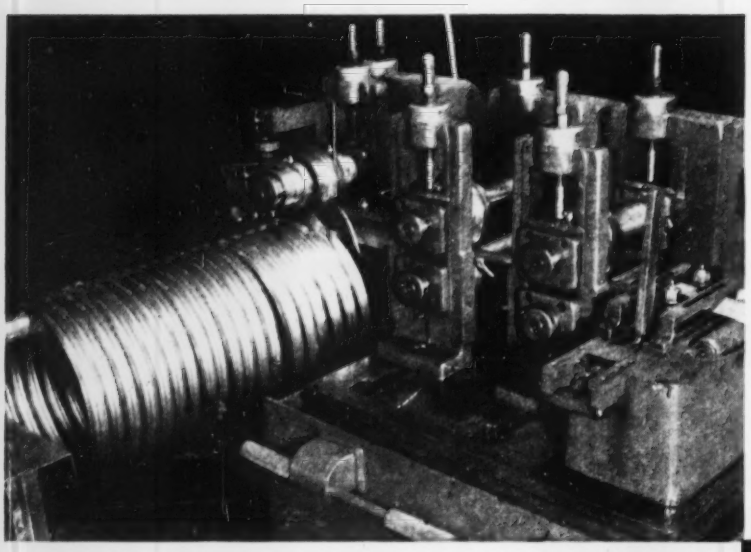
Name _____

Company _____

Street _____

City & Zone _____ State _____

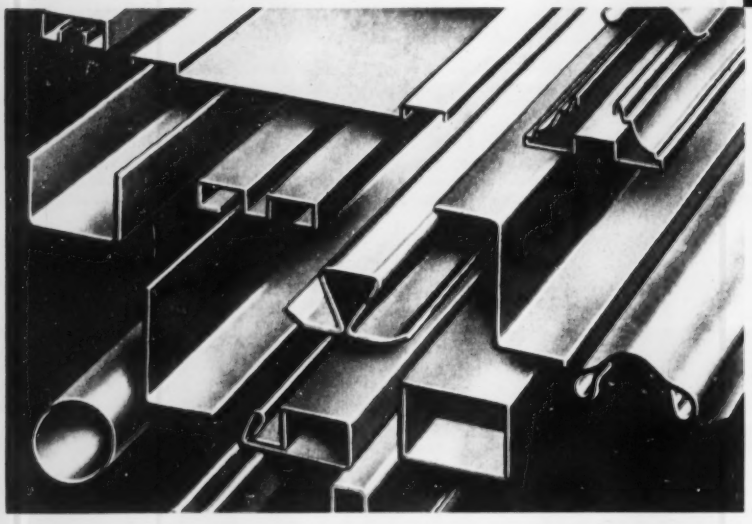
ST-1



Curving Coiling and Ring Making

IN A

COLD ROLL FORMING MACHINE



CURVING and coiling to almost any diameter, are two out of many operations which can be performed in a Yoder roll forming machine. As fast as formed, the sections can be continuously coiled and cut to length to make rings for auto hub caps, headlights, wheel trim, stator rings, etc., at a huge saving in cost of materials and labor.

Among other operations which can be tied in with cold roll forming may be mentioned embossing, notching, perforating, welding, flattening, lock-seaming, filling and closing tubular shapes, wrapping, edge trimming, etc.

In the design and assembly of production lines of this character, the know-how of the Yoder engineering staff is at your service. The Yoder book on Cold Roll Forming deals broadly with the most important phases of the subject. Ask for it.

•

THE YODER COMPANY
5502 Walworth Avenue
Cleveland 2, Ohio

Complete Production Lines

- ★ **COLD-ROLL-FORMING** and auxiliary machinery
- ★ **GANG SLITTING LINES** for Coils and Sheets
- ★ **PIPE and TUBE MILLS**—cold forming and welding

ENGINEERING YODER MANUFACTURING

DEPENDABILITY . . .
that builds reputation
Delco Motors

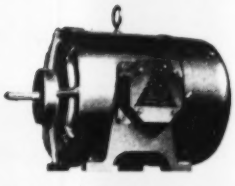
If your product needs a power source, look to Delco for the motor that will serve you best. Delco makes motors for most industrial applications . . . motors famous for dependability and long life under the toughest operating conditions.

So . . . check on Delco. You'll find a Delco motor that fits your needs. For complete details write to Delco Products, Dayton, Ohio, or to the nearest sales office listed below.

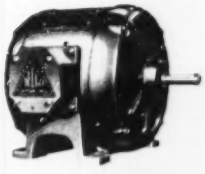
DELCO DAYTON OHIO

DELCO PRODUCTS

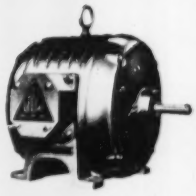
Division of General Motors Corporation
Dayton, Ohio



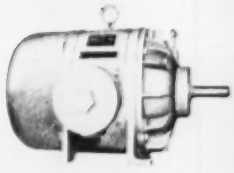
Totally Enclosed Fan-Cooled Motor



Open Ball-Bearing Motor



Totally Enclosed Motor

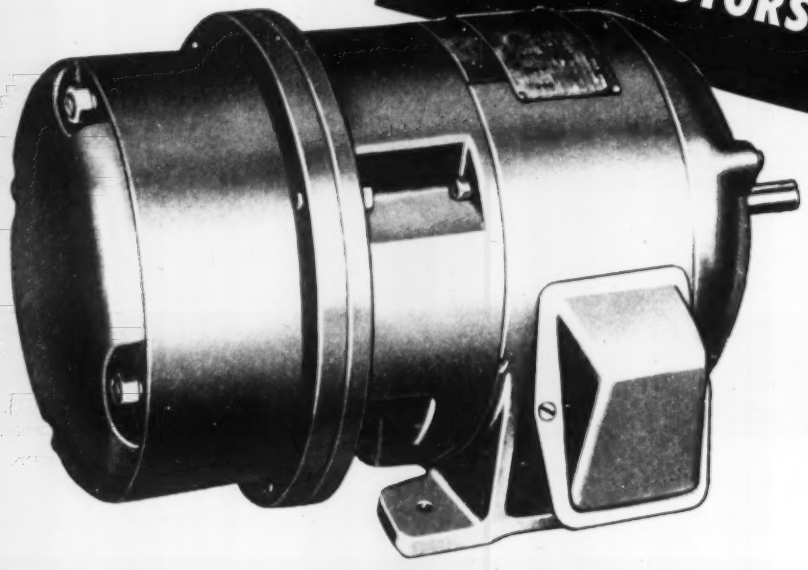


Explosion-Proof Motor

SALES OFFICES: Atlanta • Chicago • Cincinnati • Cleveland • Dallas • Detroit • Hartford • Philadelphia • St. Louis • San Francisco

Split-second STOPS call for...

ELLIOTT CROCKER-WHEELER BRAKE MOTORS

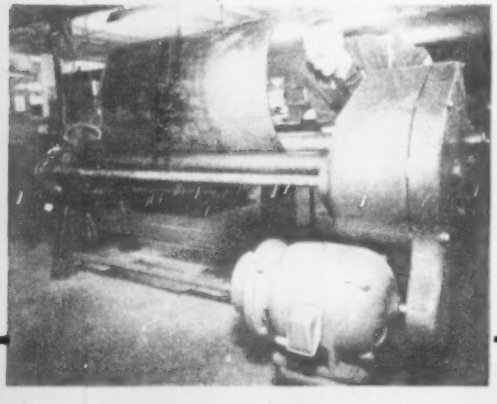


Here's a brake that has everything demanded of the most exacting service. Check over these valuable features:

NEW "CLOSE-COUPLED" COMPACTNESS that not only enables it to fit in limited space, as in machine tools and similar equipment, but also provides the rigidity and sturdiness to take the stress of constant sudden stoppage.

TORQUE ADJUSTMENT FROM THE OUTSIDE OF THE CASE.

TYPICAL APPLICATION – This roll-forming machine has to stop movement of the work exactly on a layout line. The Elliott Crocker-Wheeler brake motor does the trick.



PRACTICALLY NON-WEARING BRAKE ACTION, with metal-to-metal contact of "Velvetouch" discs and stationary plates for greater friction, quicker stops, and entire immunity to heat, cold, dampness, fungi, oil or grease.

QUICK-REMOVABLE WRAP-AROUND COVER enables inspection of all brake parts from the side of the brake.

SUPERIOR MAGNET CONSTRUCTION, up to the highest Crocker-Wheeler standards.

If you want a free-running brake that clamps down to an instantaneous dead-on-the-line stop when the power clicks off, this is it.

The Elliott C-W brake can be supplied with Crocker-Wheeler integral motor. It is also available as a separate unit for mounting on double shaft extension NEMA standard D flange motors, frames 203-326 or C face motors, frames 364-405. It needs no mounting brackets nor adapters.

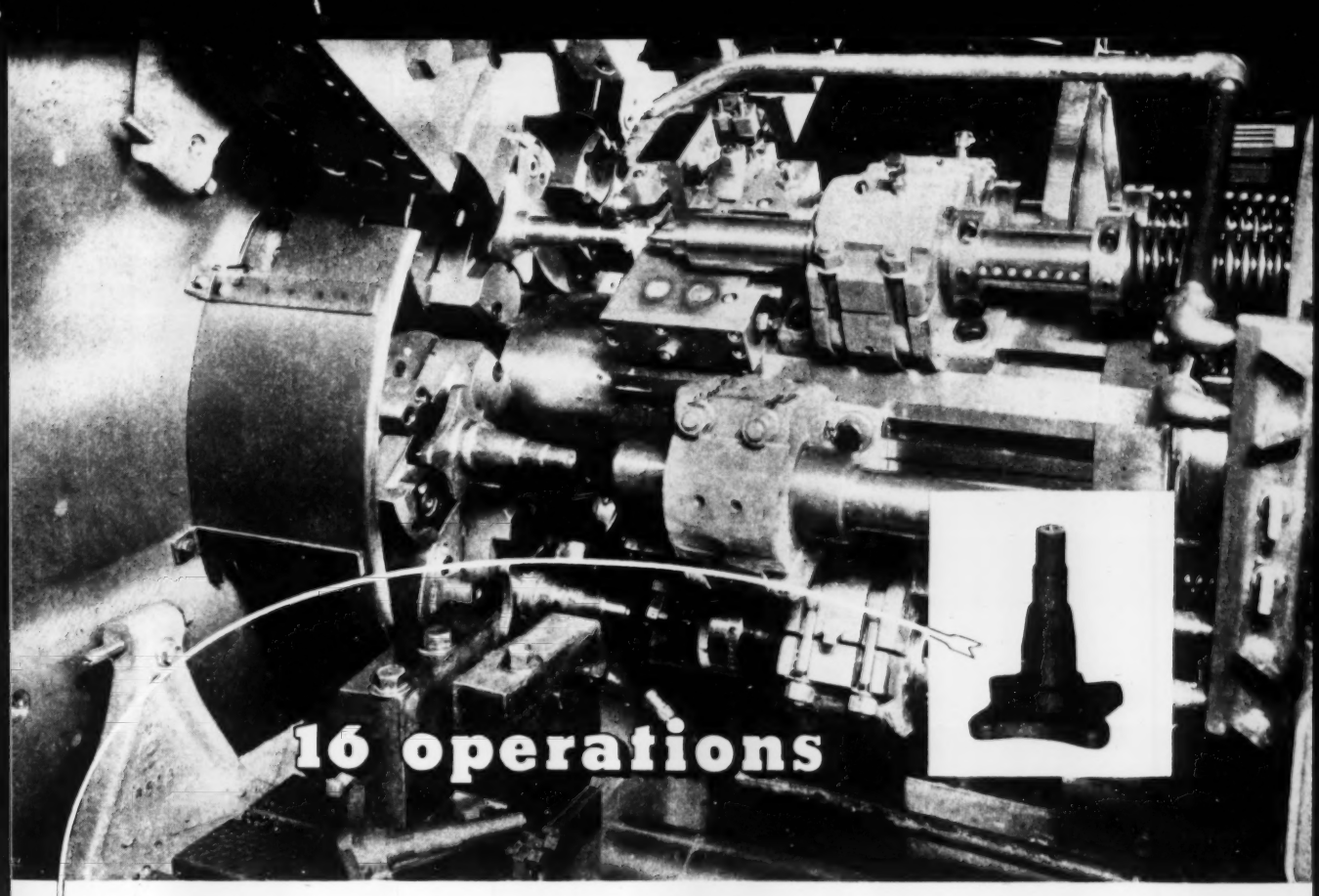
GET THE BRAKE MOTOR BULLETIN

Ask your local Elliott field engineer, or write Elliott Company, Jeannette, Pa.

ELLIOTT Company

CROCKER-WHEELER DIVISION

W3-1



in 16 seconds

on an 8-inch, 6-spindle ACME-GRIDLEY Hydraulic Chucker

When Willys-Overland Motors, Toledo, O. changed methods to cut machining costs on larger production runs of this forged wheel spindle, they didn't buy the machine on general claims. *They bought guaranteed end results—16 operations in 16 seconds.*

They bought a carefully engineered plan of tooling for this particular job—with hydraulic centering loader, unique toolholder combinations for the 16 carbide insert tools, including 5 interrupted cuts on the flange face at 860 S.F.M.

There is another reason—Willys-Overland, like all other big automotive firms, has employed scores of Acme-Gridley Bar Automatics from 10 to 30 years. Based on this experience, it is logical that they seek our advice about advanced practices in tool engineering of Chucking Automatics.

For, no other source offers so much in design and tooling experience on bar and chucking automatics—more than 45,000 machines built.

For end results, cost savings, ask your engineers to contact ours.

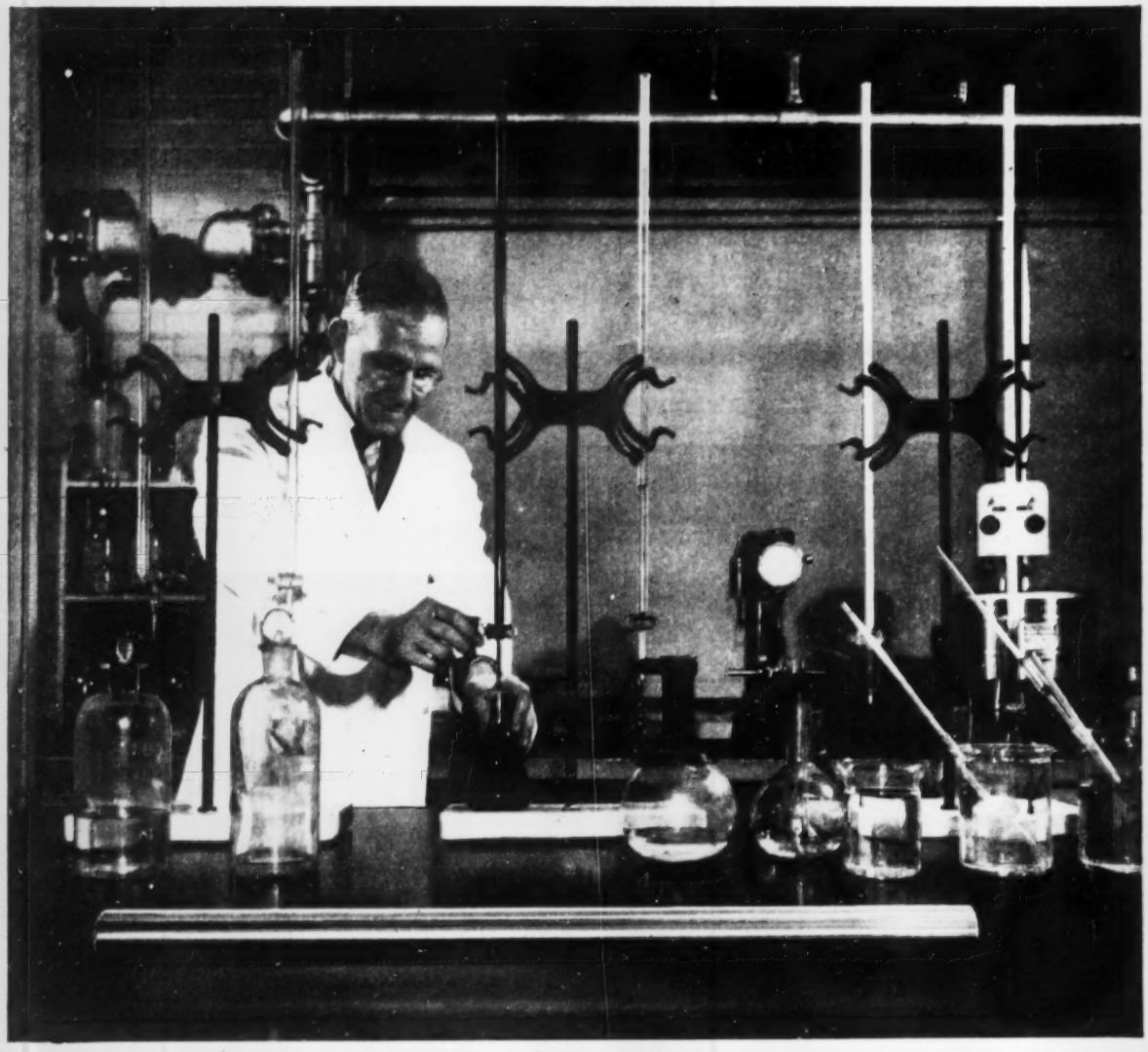
JOB FACTS

PART	Front Wheel Spindle
SIZE	5¼" long, 4⅜" swing
MATERIAL	Steel forging, AISI-C1040
OPERATIONS	16, all with Carbide Tools
MACHINE TIME	16 seconds (225 per hr.)

The NATIONAL ACME COMPANY

170 East 131st Street • Cleveland 8, Ohio.

ACME-GRIDLEY BAR AND CHUCKING AUTOMATICS (1-4-6 AND 8 SPINDLE) • HYDRAULIC THREAD ROLLING MACHINES • AUTOMATIC THREADING DIES AND TAPS • LIMIT, MOTOR STARTER AND CONTROL STATION SWITCHES • SOLENOIDS • CONTRACT MANUFACTURING



Here's how we measure the "Muscle" in an Alloy Bar

Columbia alloy bars have muscle—and plenty of it. It's the kind of uniform strength that our many customers have learned to rely on, because each alloy bar is made to the same exacting standards as the last.

Only specially selected raw material is used. This material is subjected to a continuous series of tests (like the one shown above) to verify its exact metallurgical content. What's more, each step of our production is rigorously Quality-Controlled by our laboratory to produce alloy bars that you can use in *your production* with minimum treatment and waste. ● More product information—technical assistance, too—are yours for the asking. Call or write today.

Columbia STEEL & SHAFTING COMPANY

Pittsburgh 30, Pennsylvania

SPECIALIZING IN COLD FINISHED STEEL BARS and SEAMLESS STEEL TUBING

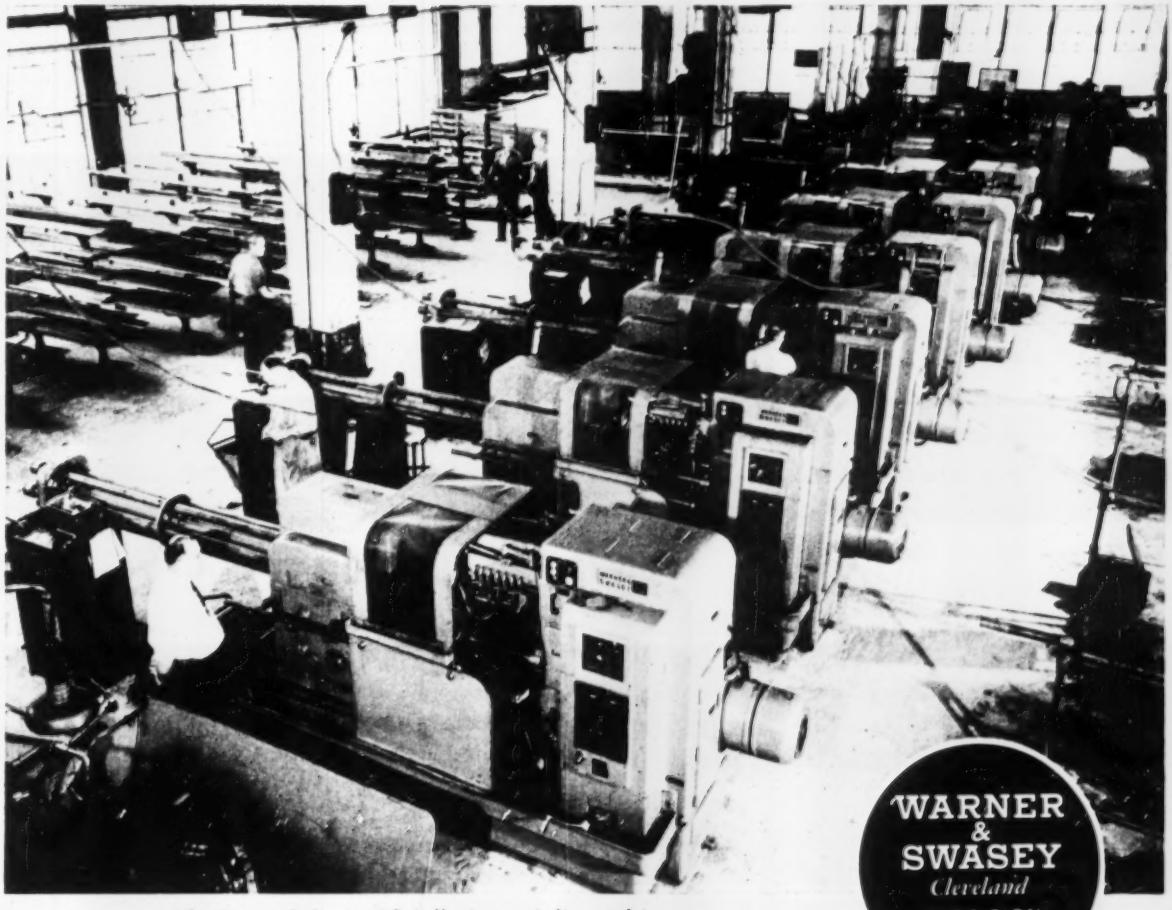
Modernization pays off!

6 MACHINES NOW DO THE WORK OF 17

● As part of their modernization program, Otis Elevator Company replaced 17 machines with 6 Warner & Swasey 5-spindle Automatics. These automatics are used at Otis for short runs on specially-machined parts—studs, bolts, nuts and other screw machine products—required for custom-made elevators.

The results of this modernization program: increased production in less floor space, more uniform parts, and six critically needed men released for work elsewhere in the plant. At Otis only 3 men are required to set up and operate these 6 automatics.

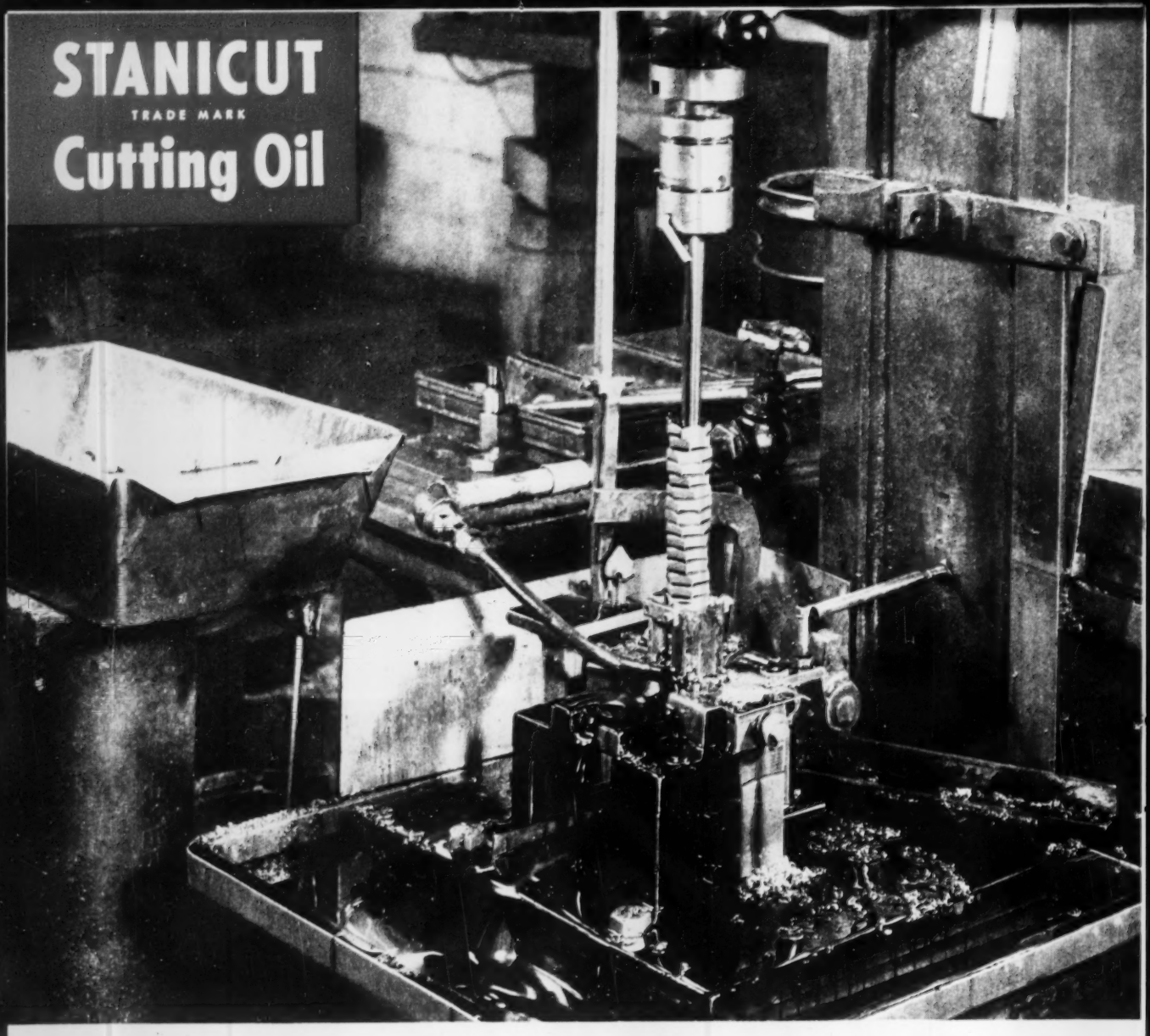
Because of its quick setup and ease of operation, the Warner & Swasey 5-spindle Automatic makes automatic production economical on short runs as well as large lots. It's a machine designed to meet the requirements for lasting accuracy and increased production for the years ahead.



The Warner & Swasey 5-Spindle Automatic line at the Yonkers Works of the Otis Elevator Company.

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

STANICUT
TRADE MARK
Cutting Oil



Tapping problem solved; production boosted 25%

● A midwest manufacturer was having trouble with a thread tapping operation. Performed on the drill press shown above, the job called for the tapping of a ⅜-inch threaded hole in nuts made from C-1018 steel stock. The quality of threads tapped was poor. Rejections ran high because of torn threads.

Consulted on this problem, a Standard Oil lubrication specialist recommended the use of STANICUT Cutting Oil 309 BCS. Replacing a conventional cutting fluid, STANICUT turned the tide on troubles. With its use, quality of threads has been excellent. Rejections have been reduced to a minimum. Production has been boosted 25% —an increase of approximately 100 pieces per hour!

Whatever your cutting oil problem, the Standard Oil lubrication specialist in your section of the Midwest can help you solve it. Backed by one of the most complete lines of cutting oils on the market, he has the training and experience to apply those products most effectively. You can contact him by phoning your local Standard Oil (Indiana) office. Or write: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?

D. F. Wallace of the Standard Oil office in Saginaw, Michigan, is the lubrication specialist who helped this midwest manufacturer solve a serious problem through the use of STANICUT Cutting Oil.

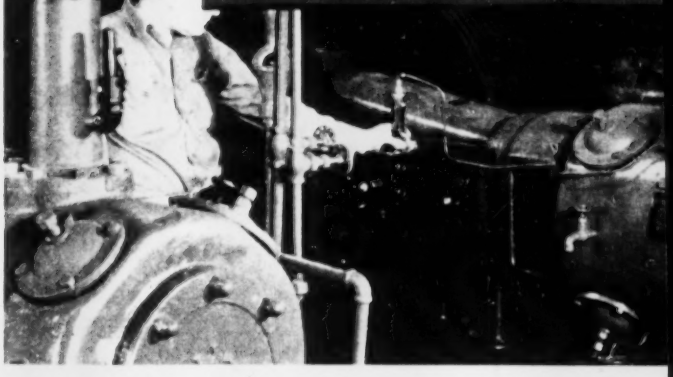
Like all Standard Oil lubrication specialists, he has a broad background of practical experience plus thorough training in Standard's own schools. And like all lubrication specialists, his on-the-job help is always available. He is one of a corps of experienced men who make their headquarters wherever industry is located throughout the Midwest.

For help with your problem, call for the services of your Standard Oil lubrication specialist today! A call to your local Standard Oil office is all that's necessary.

STANDARD

STANDARD OIL COMPANY
(INDIANA)

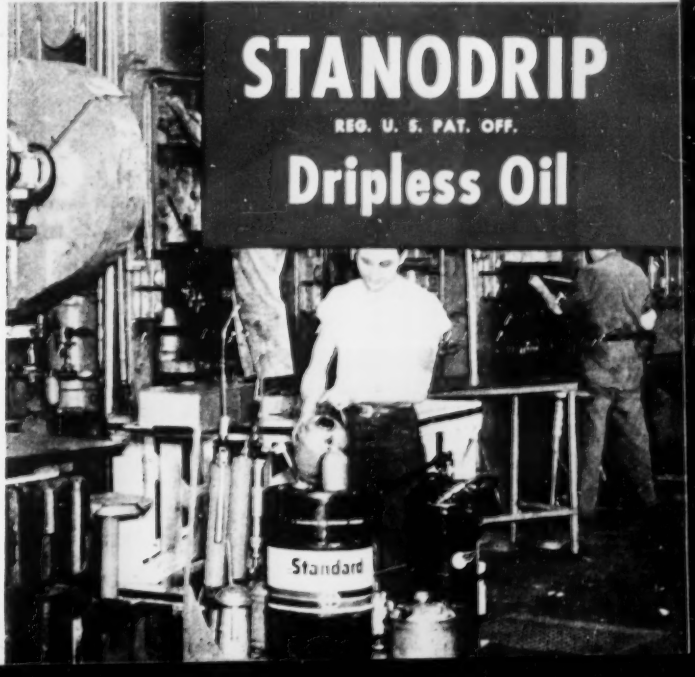
STANOIL
TRADE MARK
Industrial Oil



Compressors give carbon the air. Hayes Industries, Jackson, Michigan, had air compressor trouble caused by formation of carbon on valves. With the change to STANOIL Industrial Oil, compressors gave the air to carbon troubles and have breezed through four years of hard operation without difficulty. Over the oil previously used, STANOIL has given four times longer service in crankcases.

No drips in this press room. STANODRIP Dripless Oil solved a press room lubrication problem at A. O. Smith Corporation Kankakee Works. It put a stop to drippage of oil from bearings on stamping and punch presses. Results: cleaner and safer working conditions, less lubricant consumption, fewer applications of lubricant.

STANODRIP
REG. U. S. PAT. OFF.
Dripless Oil



*Built & Sold by Waterbury-Farrel In The United States Of America And Canada Only.

SCREW SLOTTING NEWS

REVOLUTIONARY, NEW WATERBURY-FARREL MACHINE SLOTS 500 TO 2000 FINISHED BLANKS PER MINUTE

Unprecedented Saw Life Per Grind

This new Waterbury-Farrel #1 High Speed Screw Head Slotting Machine uses only one hopper, one dial and one saw to pour out from 500 to 2000 burr-free, slotted blanks per minute.

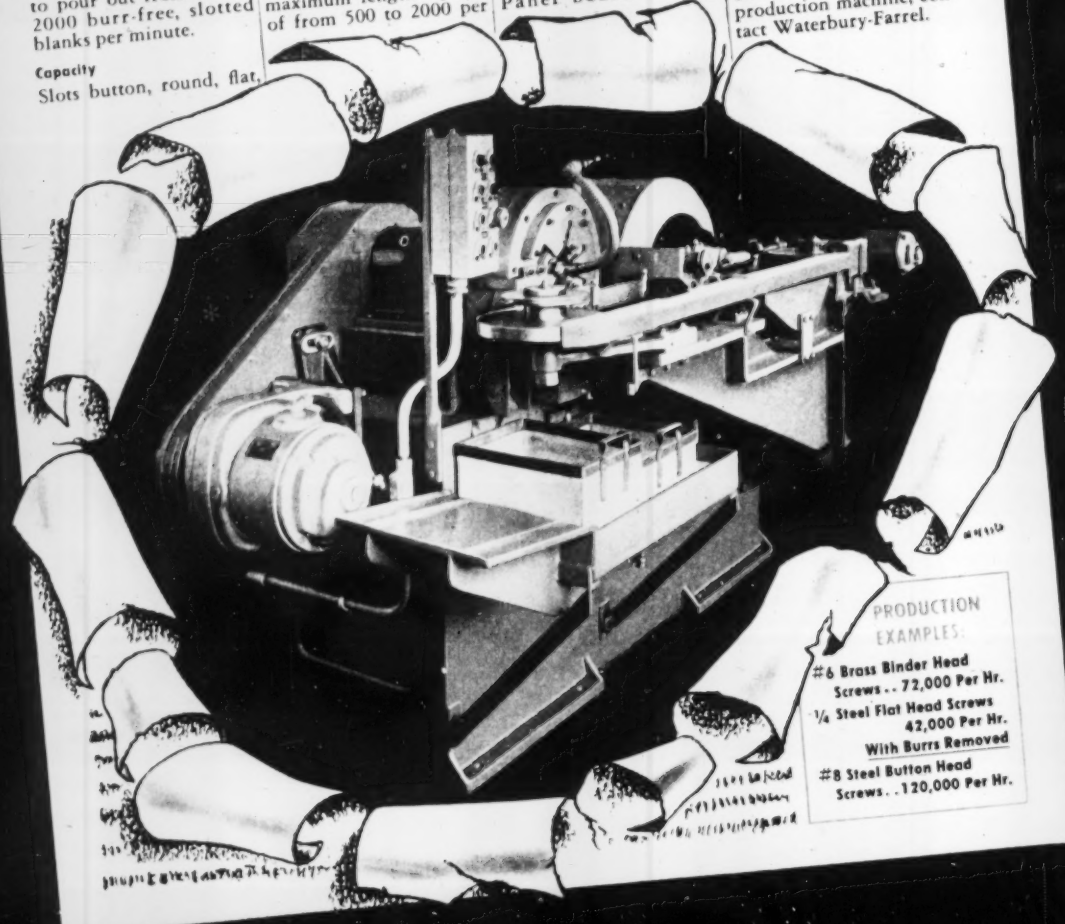
Capacity

Slots button, round, flat, flat oval, fillister, truss or binder heads (of brass or standard lower carbon machine steel), in sizes from #6 by 1/4" minimum length to 1/4 by 3" overall maximum length. Speeds of from 500 to 2000 per min. depend upon shape and size of head and whether steel or brass is used.

Fully Electrically Driven . . . Lubrication Safety Interlocked

Panel board control switches are safety interlocked so that oil flow must be started first. Then the saw, dial and feed are each started in that order by separate switches.

For further information on this outstanding new production machine, contact Waterbury-Farrel.



PRODUCTION EXAMPLES:

#6 Brass Binder Head Screws . . 72,000 Per Hr.

1/4 Steel Flat Head Screws 42,000 Per Hr. With Burrs Removed

#8 Steel Button Head Screws . . 120,000 Per Hr.

WATERBURY-FARREL FOUNDRY & MACHINE CO. WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL • *COLD PROCESS BOLT AND NUT MACHINERY*—Headers (all types) • Re-headers • Trimmers • Thread Rolling Machines • Slotters Nut Tappers, etc. *POWER PRESSES*—Crank, Cam and Toggle, also Rock and Pinion Presses • Multiple Plunger Presses • Hydraulic Presses, etc. *MILL MACHINERY*—Rolling Mills • Wire Flattening Mills • Chain Draw Benches • Slitters and various accessory mill machinery. *WIRE MILL EQUIPMENT*—Continuous Fine Wire Drawing Machines (Upright Cone and Tandem) • Bull Blocks • String-up Machines • Spoolers, etc.

FOUNDED WATERBURY FARREL 1851

WF 5

Sure cure for the "shakes"

UNDER the terrific vibration of aircraft engines, screws and nuts have a tendency to become loose. That's why Army, Navy and Air Corps specifications call for safety wiring on engine mountings, instruments, gun sights, magnetos . . . *etery* place on a plane where a screw or nut might shake loose.

By simply drawing the lock wire through a small hole in each nut or screw, and then twisting tightly with pliers, a positive sure cure for the "shakes" is provided.

Wire for this important function must be highly resistant to corrosion, tough enough to resist fracturing under the heat and vibration of aircraft engines, and soft enough to twist with pliers for quick assembly and replacement of parts. Here at National-Standard we've developed a type of slow-annealed stainless steel wire to fully meet these exacting requirements. And we're drawing millions of feet of this wire, not only for aircraft but also for many other automotive applications.

Developing special wire for special purposes has been an important part of National-Standard's business for more than 45 years. Perhaps our unique engineering and manufacturing facilities can help you with your wire and wire fabricating problems.

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL..*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD..*Niles, Mich.*	Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE..*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY..*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS..*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

Whose cheese is being divided?

TWO cats could not agree on fair division of a tasty cheese. "Let's go to the monkey," said one, "He is all-wise and can divide our cheese fairly." So to the monkey they went.

The monkey immediately broke the cheese evenly and judicially put the two pieces on the pans of his balance. But one was slightly heavier. He shrewdly nibbled that piece a bit and put it back on the scales. Now it was the lighter piece. So he bit off some of the other piece only to find it the lighter. Thus while the two hungry cats watched, the monkey kept taking bites of the cheese, first one piece, then the other, until finally the cheese had almost disappeared.

"What's left is too small to divide," sagely pronounced the monkey, as he popped the remaining fragments into his mouth.

Observers of the American scene see a direct parallel between the record of federal taxation and this ancient parable of the trusting cats, the greedy monkey and the cheese. Business and the individual citizen have been content to trust government to rule on the disposition of their earnings. And Uncle Sam keeps taking bite after bite out of the shares of both individual citizen and business.

Already government bites are so large as to severely penalize citizens and business alike. If allowed to continue, it will seriously impede further industrial progress and growth, stifle initiative and threaten the strength of our free enterprise system. Beware the day—goal of the socialists among us—when the monkey says, "What's left is too small to divide."

QUALITY YOUNGSTOWN SERVICE

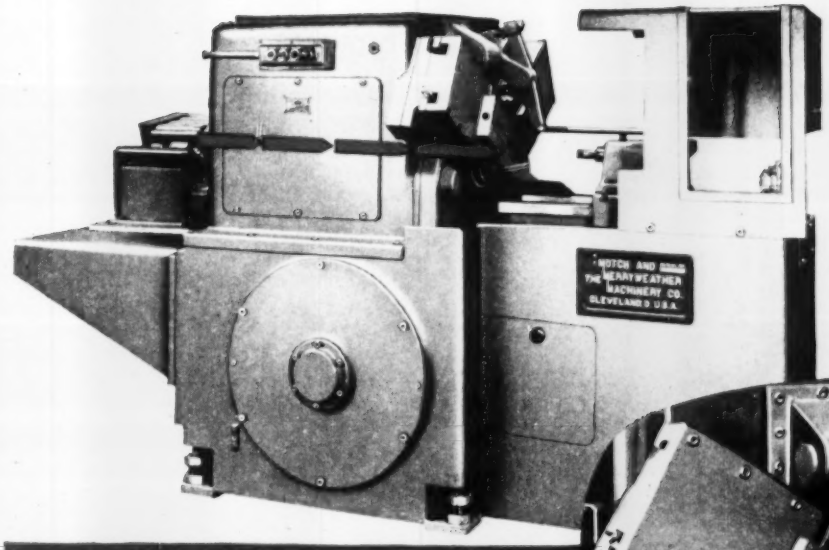
The Youngstown Sheet and Tube Company

General Offices -- Youngstown 1, Ohio

Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

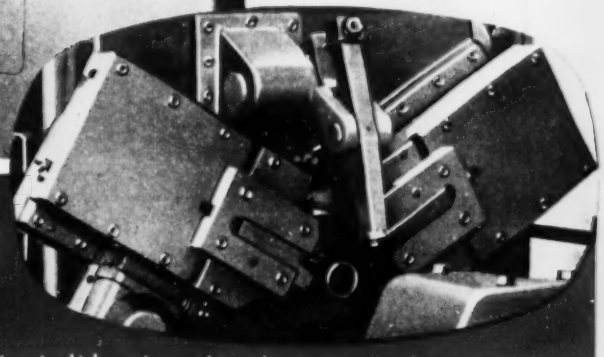
RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.



MP/SF

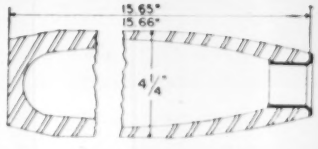
Most Production per Square Foot

Conveyor carries shells to hopper. Shells are fed automatically through hollow spindle, machined and ejected onto conveyor.

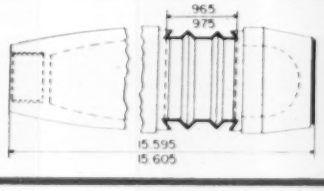


MOTCH & MERRYWEATHER *Automatics* make the most of AUTOMATION

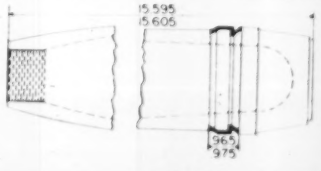
Material: shell steel SAE 1050.
Operation: bore, face, chamfer (nose end)
Estimated Production: 220 pcs/hr. @ 100%.



Material: shell steel SAE 1050.
Operation: face base, turn band groove and band relief.
Estimated Production: 120 pcs/hr. @ 100%.



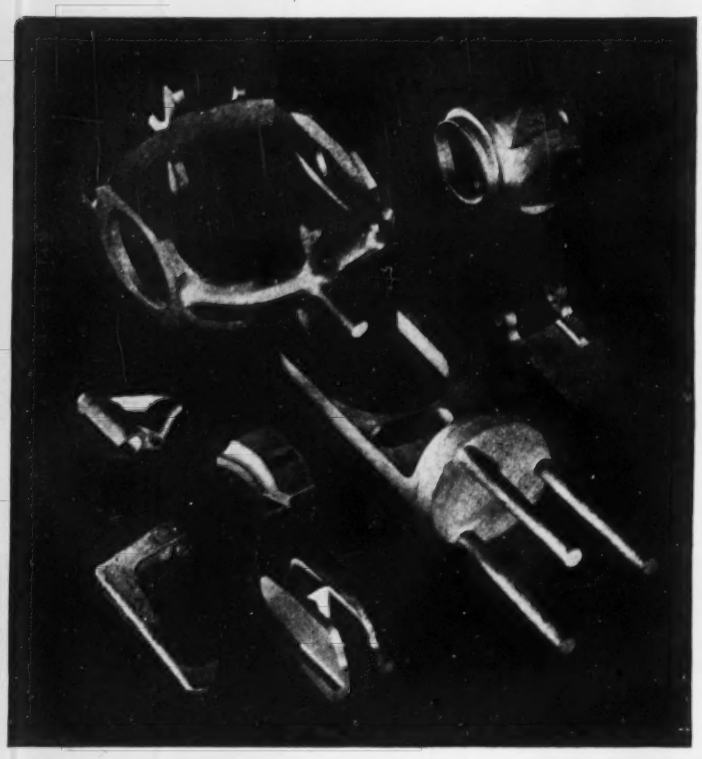
Material: shell rotating band.
Operation: turn band.
Estimated Production: 220 pcs/hr. @ 100%.



This single-spindle, form-turning automatic, developed for civilian production, has been assigned to much heavy duty munition work. Loading, positioning and unloading are completely automatic. All functions are actuated by hardened cams. With operator fatigue eliminated, one man can service several machines.

Manufactured by — THE MOTCH & MERRYWEATHER MACHINERY CO. —
CLEVELAND 13, OHIO
Builders of Circular Sawing Equipment, Production Milling, Turning and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

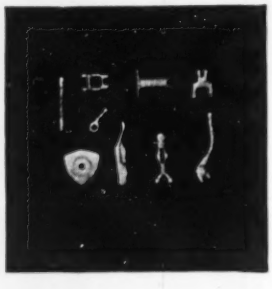


Accumet Precision Castings

for all industrial uses

With Accumet Precision Castings, Crucible has developed a process of producing precision investment castings in intricate designs with the smooth, satiny finish and closely-held dimensions characteristic of "lost wax" castings. Casting tolerances start at plus or minus 0.005" although under certain circumstances closer tolerances can be held. This relatively new metal forming process solves many difficult problems in design, tooling and production of metal components.

fuel injectors from precision castings



Fuel injectors and carburetors for aircraft are mechanisms containing a variety of peculiarly shaped component parts. The usual procedure is to use hardenable, chrome stainless steels, Types 416 and 440F, which are most adaptable to easy machining. However, to save costs in machining from bars, stocks and forgings, Crucible applied Accumet Precision Castings. The close size control and good surface finish of the castings eliminate many costly machining operations — saving manpower, machine time and tooling expense.

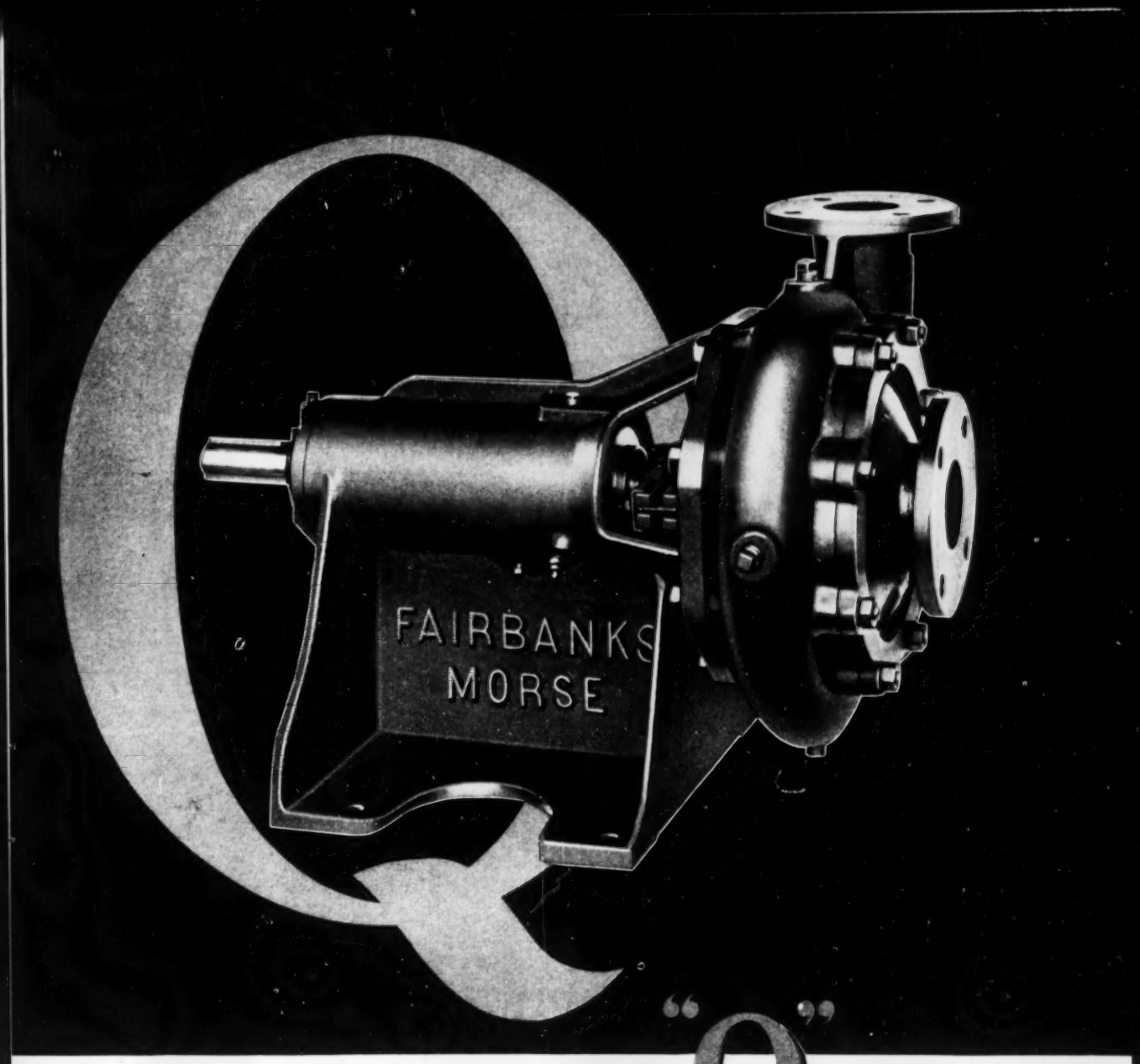
more information available on castings

Long a leader in the development of precision investment castings, Crucible offers you the services of an alert metallurgical staff to help you profitably apply these specialty steels to your operation. Write us for more detailed information. CRUCIBLE STEEL COMPANY OF AMERICA, General Sales and Operating Offices, Oliver Building, P. O. Box 33, Pittsburgh 30, Pennsylvania.

CRUCIBLE first name in special purpose steels

52 *years of* *Fine* *steelmaking* **PRECISION CASTINGS**

REX HIGH SPEED • TOOL • STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



it's Your "Q"

Quality . . . that costs no more is yours when you choose Fairbanks-Morse Side Suction Centrifugal Pumps. Extensive engineering laboratories . . . production line methods with precision machining of all parts enable Fairbanks-Morse to offer you a side suction centrifugal with the design, workmanship and performance normally obtained only in highest quality split-case pumps.

Open type, single suction, high efficiency impeller . . . ball-bearing frame construction for long life and smooth operation . . . one-piece, solid cast frame . . . close-grained smooth cast iron volute . . . are among the many big pump features you'll find in these moderate priced side suction centrifugals.

For a "cue" to better pump performance, choose the pumps that spell quality with a capital "Q" . . . Fairbanks-Morse Side Suction Centrifugals. Fairbanks, Morse & Co., 600 S. Michigan, Chicago 5, Ill.

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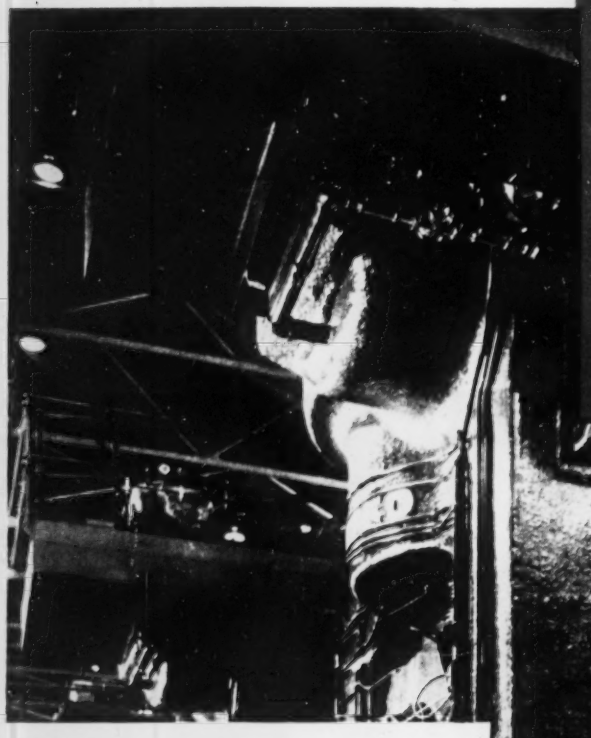
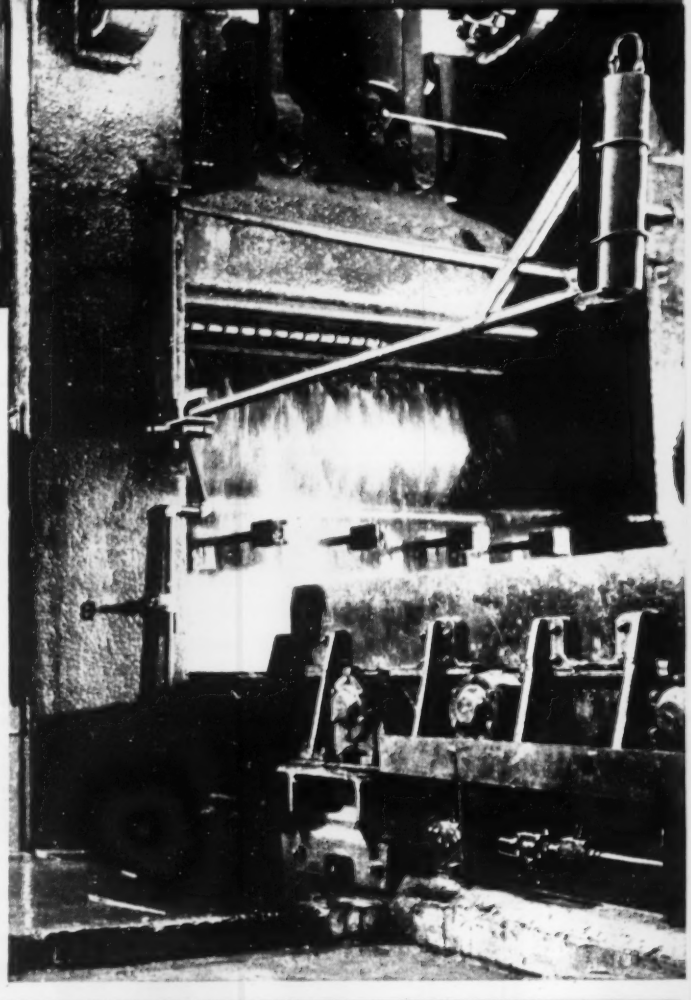
a name worth remembering when you want the best

PUMPS • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY • SCALES • HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS

KEEP 'EM ROLLING with TEXACO REGAL OIL





HERE'S HOW: The oil film bearings of your back-up rolls will do a better job for you, and cost you less for maintenance when they're protected with *Texaco Regal Oil*. This turbine-quality oil stands up under heavy loads and high temperatures.

Texaco Regal Oil resists oxidation, emulsification and sludging. It keeps the oil lines clear, permitting clean, cooling lubricant to flow constantly to the bearings. Your bearings last longer. Your costs come down. There is a complete line of *Texaco Regal Oils* to meet your exact requirements.

Over on the drive side, the best protection for enclosed reduction gears is *Texaco Meropa Lubricant*. Its high and lasting EP properties assure longer gear life and lower maintenance costs.

Talk to a Texaco Lubrication Engineer. He can help you "keep 'em rolling." Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television Tuesday nights METROPOLITAN OPERA radio broadcasts Saturday afternoons.

The Metalworking Outlook

February 23, 1953

Autos Are the Key

Now that production ceilings have been removed from automobiles, the industry undoubtedly will be able to turn out 6 million cars in 1953. The real question is: Can it sell 6 million? It sold about 4.3 million in 1952, 5.6 million in 1951 and nearly 7 million in 1950. The answer to the question will have a big bearing on steel's availability for the rest of the year. Many steel market analysts are betting that the auto men won't be able to sell quite 6 million cars. That's one reason why the Steel Products Industry Advisory Committee, meeting Feb. 17 to discuss decontrol, said that it's now "safe" to open-end CMP. It wants NPA to go even further and announce at once that all distribution controls will end July 1 except for steel required by the military.

Basic Metal Prices

Basic metal prices will be decontrolled last. So, look for OPS to allow some more price increases in that area, even though all curbs will have to end Apr. 30. In the works is authority to boost chromium by 3 or 4 cents a pound according to use, cobalt by 30 cents a pound, beryllium by 5.22 cents a pound and nickel and chromium needed in stainless steel by 2 or 3 cents a pound according to use. The nickel ceiling has already risen by 3.5 cents a pound.

Optimism on Copper, Brass

Copper and brass mill production for 1953 should be higher than for 1952. That's the opinion of Herman W. Steinkraus, chairman and president of Bridgeport Brass Co. His company's January sales were 10 per cent above those of January, 1952, and the entire first quarter should be just as good. He also predicts that more copper will be available this year than last.

Tax Cuts? Not Soon

Prospects for tax cuts are still dim, despite the House Ways & Means Committee's approval of Chairman Daniel Reed's bill to reduce them. The bill will be held up by Republican leaders. Treasury Secretary George M. Humphrey reiterates that a budget balance must come before tax cuts. The Truman budget with its $9.9 billion deficit is now making the rounds of the federal agencies involved. Their instructions are to cut to the bone.

Mr. Reuther Has Troubles

CIO President Walter Reuther has his troubles. Besides trying to maneuver the auto companies into opening their five-year contracts two years early, he has been able to place a CIO man in only the number three Labor department job while AFL men sit in the first two spots. The United Steelworkers, second-largest union in the CIO, is disgruntled with Mr. Reuther's leadership, and rumors persist that it may bolt to the AFL. To top off all his difficulties, the CIO pres-

Production-Engineering News p 81 The Market Outlook p 147

ident is getting nowhere with his pet project to merge with AFL. The latter group, figuring that it now has improved strength, is currently much cooler to the proposal than it once was.

Postponed: Resources Conference

Resources for the Future Inc., subsidized by Ford Foundation, will postpone until the fall its widely publicized conference on natural resources policy which was scheduled in Washington for Mar. 25-27. The conference was to have thrashed out Paley Commission recommendations. It was postponed at White House request because President Eisenhower wants to study the Paley report in greater detail and because the U.S. Chamber of Commerce impressed him with its charges that the conference would be strongly New Dealish in tone.

Test of Strength

One of the first major tests of President Eisenhower's strength in Congress will come over his foreign trade policy. His decision to reject tariff boosts on briar pipes is one of the latest indications that he favors lower duties and freer trade. His free-trade thinking will be supported by a study soon to be released by the Public Advisory Board for Mutual Security. The report is said to recommend some tariff reductions and more U.S. buying from allies.

More Needle Bearings

The shift to automatic transmissions by auto buyers is proving a bonanza to manufacturers of needle bearings. Some 240-280 are required per unit. A car equipped with the shiftless device now takes a total of about 400 needle bearings. Last year 2.1 million new cars were equipped with automatic transmissions.

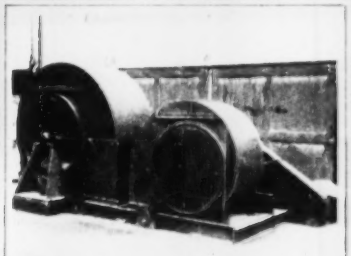
Straws in the Wind

Nonfarm employment in January was 1.3 million higher than a year earlier . . . OPS says that all sellers must retain their records even if their products have been decontrolled . . . Carrier Corp. expects five times as many room and full-house airconditioning installations this year as last . . . The Federal Reserve Board is cool to the idea that consumer credit controls should be re-established to cut down the volume of consumer debt.

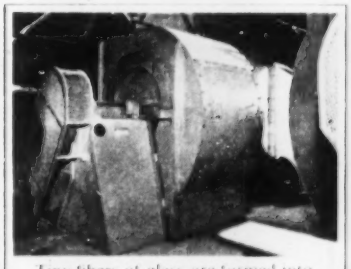
What Industry Is Doing

The open-ending of the Controlled Materials Plan won't be of great practical value in the first half of 1953 (p. 45) . . . Japanese and Western European steel producers battle for the shrinking U.S. import market (p. 46) . . . Avery C. Adams, president of Pittsburgh Steel Co., says that steel mills will probably operate at capacity throughout 1953 (p. 47) . . . Makers of industrial brushes did a $60 million business in 1952 and expect to sweep up higher sales in the years ahead (p. 48) . . . Sharp variations are occurring in the sales growth of different metalworking industries (p. 49) . . . Kaiser Aluminum & Chemical Corp. opens its bauxite mining facilities in Jamaica (p. 50) . . . Imported aluminum is snapped up by U.S. fabricators (p. 50) . . . College graduates are drawing a premium price in the industrial market (p. 51).

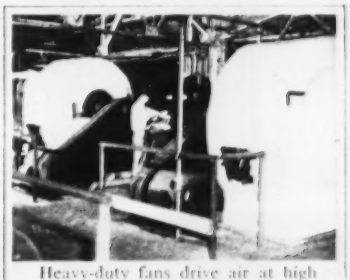
Without an infallible air supply at many process stages, Owens-Corning could not make their famous Fiberglas.



Sturtevant fans keep furnace exteriors cool, prevent refractory brick from disintegrating.



Tiny fibers of glass are formed into Fiberglas mat by air, put to work with Sturtevant fans.



Heavy-duty fans drive air at high temperatures through Fiberglas mat to cure bonding agent.

FAN THE FIRE

TO MAKE A MILLION MARBLES

These machines swallow glass at 2200° F, spit out 320 red-hot marbles a minute. In one day, they produce more than a million marbles to feed forming machines turning out a multitude of famous Fiberglas products.

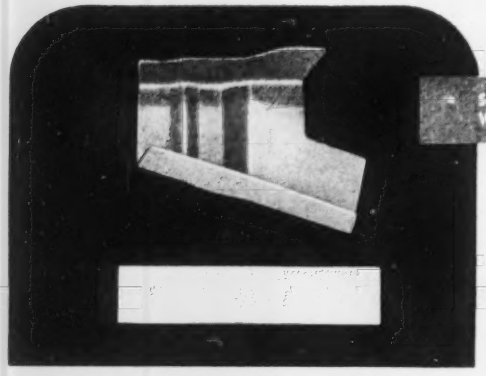
Air plays a vital role in many ways in glass making. Take, for example, the combustion air to the glass furnace. If it failed for only a short time, the entire melt would be lost and it would require a week to rebuild the furnace. And throughout this huge plant, over 150 Sturtevant fans like those pictured at right give production an assist by *putting air to work* in both cooling and heating processes.

Our specialty is making air work for you . . . with a complete line of air handling, air conditioning and air cleaning apparatus. For help on your problem, call your local Westinghouse-Sturtevant office, or write Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Massachusetts.

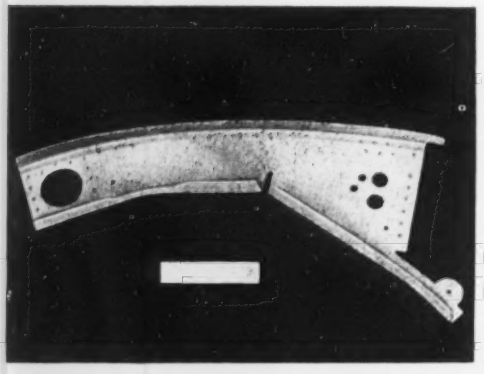
YOU CAN BE SURE... IF IT'S

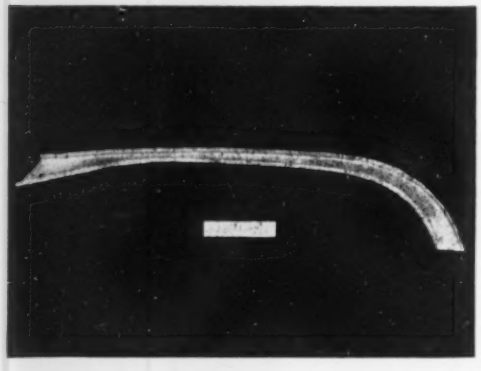
Westinghouse

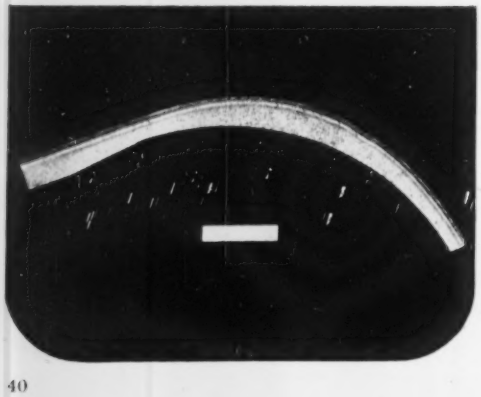
J-80242



Stainless structural parts for airplanes. White rule represents 6 inches.







50% GREATER DESIGN STRENGTH

With Armco 17-7 PH

Vital formed structurals in certain airplane fuselages formerly were made of Type 301 half-hard temper stainless steel. Here is what the manufacturer gained by changing over to Armco 17-7 PH Stainless Steel:

50-94% INCREASE IN YIELD STRENGTH

Instead of a yield strength in tension of 110,000 psi minimum, he had his choice of yield strengths as high as 165,000 psi minimum in finished parts.

Yield strength in compression could be increased correspondingly from 85,000 psi to as high as 165,000 psi minimum.

23% INCREASE IN TENSILE STRENGTH

Ultimate tensile strength of the finished structural parts could be increased from 150,000 psi minimum to as high as 185,000 psi.

IMPROVED WORKABILITY

Fabrication difficulties were also overcome. Half-hard temper Type 301 must be worked in the hard condition. With an elongation of only 15-18 per cent in 2", it is difficult to form and results are often inconsistent.

On the other hand, Armco 17-7 PH may be worked in the fully annealed condition and hardened by heat treatment *after fabrication*. With an elongation of 20-40 per cent in 2", it will take far more severe forming than Type 301, half-hard. Its high strength is developed through a double low-temperature heat treatment of 1400 F plus 950-1050 F. Scale developed in heat treatment comes off readily in sandblasting.

This is but a thumb-nail sketch of the advantages of Armco 17-7 PH in structural applications. Write for complete information on this precipitation-hardening chromium-nickel stainless steel.

ARMCO STEEL CORPORATION

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Plants and sales offices from coast to coast
Export: The Armco International Corporation

ARMCO STEEL

P. R. Is Every Company's Job

While the United States government was in the hands of "new dealers" and "fair dealers," the term "private enterprise" became such a political football that a large segment of the American public became confused as to its true meaning and its real economic significance. While it is true that Presidents Roosevelt and Truman frequently gave ardent lip service to private enterprise, at the same time some of their associates lost no opportunity to damn it with faint praise and a few actually planned for its ultimate destruction.

Now that the climate in Washington has changed, there is an excellent opportunity for loyal proponents of competitive private enterprise to demonstrate its virtues. This task calls for a public relations performance on the part of American industry on a scale that surpasses anything it has attempted previously.

The job can be done if management will get behind it determinedly. Today more specialists trained in public relations are serving industry than ever before. Their techniques are being improved constantly. They are learning from past mistakes. At long last it is widely recognized that the basic foundation of effective public relations is the good day-to-day behavior of a company. The best P. R. man in the world cannot make a saint out of a sinner.

Naturally in the evolution of public relations activities, some companies have led the field, others have followed and some have dragged their feet. In its recent fifth annual report on American industry, *Forbes* magazine graded numerous corporations on their public relations performance. Of the scores of metalworking companies included in the study, only two were rated above 90 in public relations. General Motors and American Locomotive each scored a 95.

That a few companies in each industry group do an outstanding public relations job is encouraging, but it is not enough. What is needed is a concerted effort by every unit in every industry to do the best public relations job of which it is capable.

American competitive private enterprise will not be accorded the public esteem it deserves until good public relations becomes the rule rather than the exception.

E. L. Shaner

EDITOR-IN-CHIEF

PROVOCATIVE OPTIMISM: In addressing the New York Society of Security Analysts, Avery C. Adams, president of Pittsburgh Steel Co., began by saying, "Let me warn you that I am an optimist for the simple reason that I know our day-to-day problems can best be solved by an optimistic, positive and aggressive approach to them, rather than by a pessimistic, negative and vacillating one."

Whereupon he demonstrated his optimism by

predicting (p. 47) capacity operations in the steel industry for 1953. He also cited relationships between the demand for steel and such factors as Gross National Product, increases in population and increases in the consumption of steel per capita. On the basis of projections of these relationships, he predicted that the increased demand for steel will call for an addition of 20 million tons of ingot capacity from 1952 to 1962.

Admitting that the industry's breakeven point is rising, he said that "when the going is tough, we have found ways and means to cut costs." It was a thought-provoking address.

FAITH WILL SOLVE IT: Reports from Washington indicate that it may be difficult for the government to induce businessmen to accept some federal offices which still remain open because of the sacrifices made by Charles E. Wilson and others who disposed of large stockholdings in order to qualify. Many able executives cannot afford to do what Mr. Wilson and others have done.

An easy solution would be to relax the law (p. 62), but that may not be the best way in the long run. Right now our own country and others are at the crest of a wave of cynicism. The poison of several decades of calculated smearing has almost destroyed man's faith in men of proved integrity.

As we emerge from the horrors of maliciously planned character assassination, we may in due time return to the basic idea that a man is honest until proven guilty.

AN OVERDUE REFORM: Rep. Fred E. Busbey of Illinois introduced a bill in the House of Representatives that would create a commission of representatives of private industry to examine the 80 federal agencies that are engaged in direct competition with private enterprise. Apparently the resolution is aimed particularly at government encroachments upon the domain of privately-owned power facilities. The House action is paralleled by a Senate drive which in addition to curbing government competition with private business (p. 62) would also put the Reconstruction Finance Corp. out of business.

These moves are in the right direction. A thorough study probably would show that the federal agencies that are doing things incompetently that private operation could do much better far exceed the 80 designated. Practically every department has agencies which are rendering services which private enterprise is better qualified to perform, and at a profit from which the federal government could collect taxes.

HEADING FOR TROUBLE: In the light of recent utterances on foreign trade, the nation must give President Eisenhower and Henry Ford II grades of A plus for courage. Both have come out strongly for streamlining the mechanics of trade between nations, which has been and still is one of the world's most controversial subjects.

Mr. Ford (p. 61) is for a law encouraging rapid elimination of all tariffs, abandonment of the quota system and the Buy American Act, and for simplification of custom procedures. The President is for a freer flow of trade and reduction of red tape in customs, hedged only with some consideration for domestic producers who would be affected drastically.

This issue is of paramount importance and we might as well get it out in the open and go at it hammer and tongs. But it's going to be difficult and painful.

FREEZING IN INDUSTRY: Readers of technical articles in the business press will have noticed more frequent references to the role of refrigeration in industry. Two typical examples appear in this issue.

Weston Electrical Instrument Corp. found it necessary to develop rigid tests for electrical indicating instruments so that their performance under adverse operating conditions can be studied. One of the tortures to which they are subjected (p. 84) is to place them in cabinets in which the temperature is −55° C. Lockheed Aircraft Corp. installed a 10 x 12 x 10½ foot freezing chamber (p. 99) in which large metal parts of airplanes can be stored between fabrication operations. It can cool 2500 pounds of aluminum from room temperature to −20° F in 2 hours. Parts removed from cold storage are more easily workable and there are other important advantages, too.

MEET THAT DEADLINE with Metal Stampings from Firestone STEEL PRODUCTS CO.

LATEST-TYPE heavy-tonnage presses, like the one shown here, and closely integrated assembly operations enable Firestone to provide ON SCHEDULE delivery of your large, heavy metal stampings.

If you need stampings in a hurry and must keep costs low, it will pay you to figure with Firestone. For a complete cost analysis on stainless steel, carbon steel or aluminum stampings and sub-assemblies, write to Firestone Steel Products Company, Metal Stampings Division, Akron 1, Ohio.

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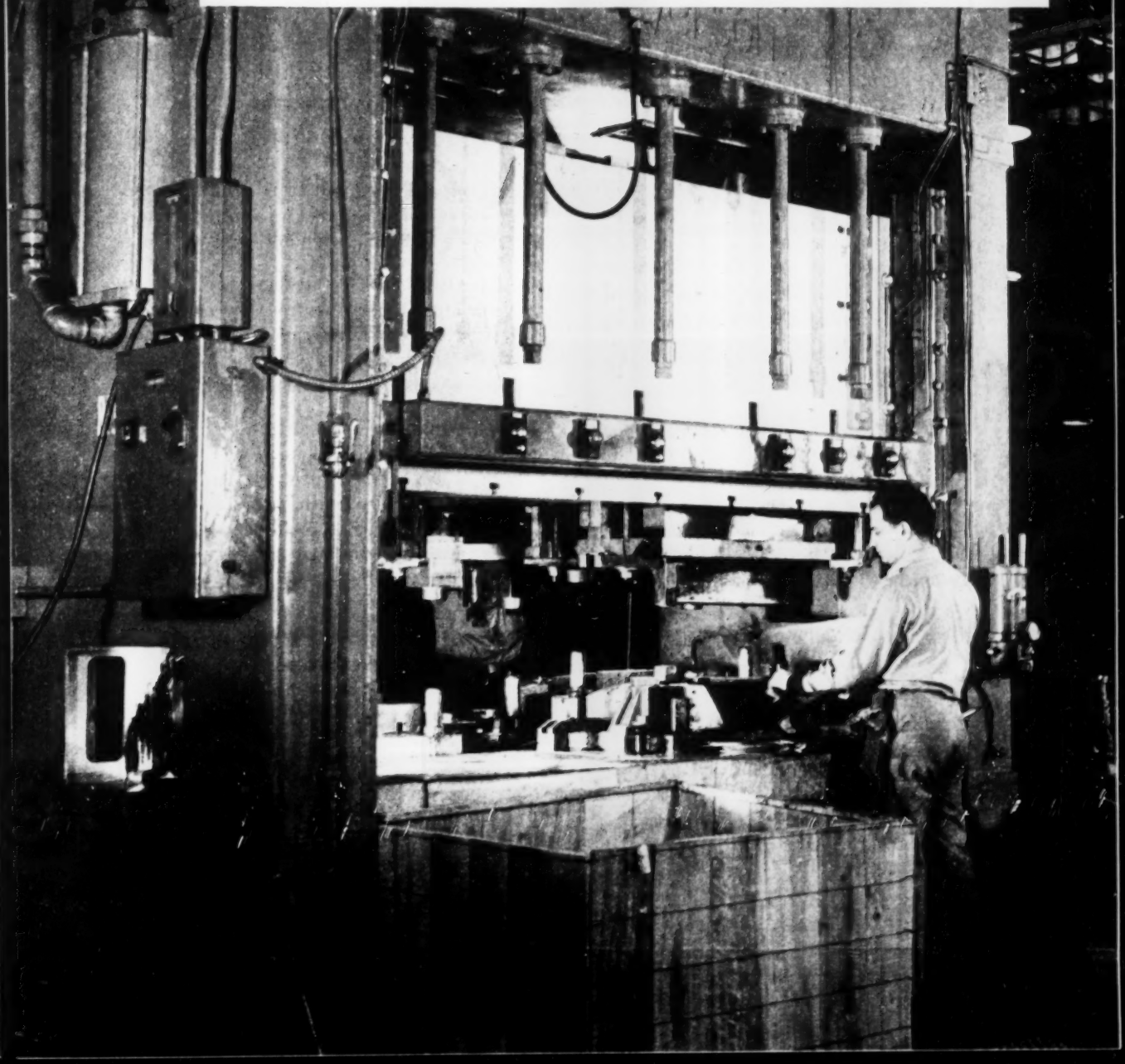

Looking for Steel?

Here are some timely suggestions

Steel stocks at your nearby Ryerson plant are improving steadily. However demand continues strong; so the steel you want may not always be on hand when you call. With this in mind, we offer the following suggestions which some of our customers have found helpful in making the most of available steel under today's difficult conditions:

1. When new products or models are still in the designing stage, a pre-check with your nearby Ryerson plant may enable you to adapt designs to the most readily available types and sizes of steel. Thus you may avoid difficulty when ready for actual production.

2. When ordering steel, tell us to what size or length you plan to process it. With this information to guide us we can often meet your requirements with selected shorts, even when we do not have uncut stocks of these items on hand.

3. Let us know the end use, or properties needed in the finished product. Then, if the steel you specify is not in stock, our metallurgists can often suggest an alternate size or analysis which will do the job and *is* available.

4. Give us a list of the steels you need, or will be needing in the near future. Keep us posted. We will check our incoming stocks daily against your requirements, let you know promptly when the steel you want becomes available.

5. Visit the Ryerson plant nearest you. Get acquainted with the Ryerson men who specialize in the types of steel you use. Discuss your steel problems with them. Learn—first hand—about Ryerson facilities and services. Such direct contact may prove worthwhile in many ways.

These suggestions are prompted by a sincere desire to be of help to you. So whenever you need steel—call Ryerson. We will always be glad to work closely with you.

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

RYERSON STEEL

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FREE METAL SUPPLY? —*Only a Trickle*

SUPPLY & DEMAND Second Quarter, 1953	CARBON STEEL (Net Tons)	COPPER (Pounds)	ALUMINUM (Pounds)
CMP Allotments*	**26,168,000**	**1,602,055,000**	**850,039,000**
Estimated Supplies	**22,778,000**	**1,340,000,000**	**740,000,000**

* Allotments for civilian-type products are set at 90 per cent of pre-Korean base period use for steel, 50 per cent for copper and 60 per cent for aluminum. All CMP tickets are never cashed, so the actual CMP claims on supplies will be lower than official allotments. This "slippage" in the past has been about 15 per cent for carbon steel, 20 per cent for copper and nearly 25 per cent for aluminum. What it will be with open-ending is anybody's guess.

CMP Open-Ending: Little Help

OPEN-ENDING of CMP is a step in the right direction, but it won't be of great practical help in the first and second quarters.

That's the consensus of producers and consumers queried by STEEL. The above figures show that little free steel, copper and aluminum can be available unless a far greater percentage than usual of the CMP tickets are not cashed.

Educated Guesses — Last week government planners guesstimated that steel available for free distribution between now and June 30 will total anywhere from 350,000 to 1.3 million tons, depending on how many tickets are not cashed. They think 60 to 100 million pounds of aluminum could be in the open end. (Producers think that's optimistic.) Planners make no guess about copper (for details on the nonferrous reaction, see p. 159).

Although there won't be enough open-ended metals to satisfy much increase in demand, the action of Feb. 13, which modified controls until June 30, will permit an orderly move toward complete decontrol after June 30 of everything but metal for the military. It will be a start toward re-establishing the old market pattern.

Here's How—Over the next four months the distribution pattern in steel will shape up this way: The first general availability of open-end steel should show up in the warehouse sector of distribution. Under Direction 20 to CMP Reg. 1, warehouses may sell without tickets or self-certification only the products which they are able to procure from mills' open-end production. Warehouses are the biggest mill buyers, so they'll get the biggest quantity of freely distributed steel.

The products in which there is likely to be free tonnage include wire rope, nails and other wire products, tool steels, some sizes of hot strip, straight chrome steels cold alloy bars, some cold carbon bars, hot alloy bars and galvanized sheets. Production directives will hold throughout the first half, and that should minimize the shifting from one product to another of more profitable nature so long as demand holds.

No Disruption—The modification of CMP is not creating undue disruption in the steel markets and probably won't for the next four months. That's because the production directives, the set-asides, self-certification and CMP allocations are still in effect. Some of the premium-price mills may have capacity to roll freely distributed steel long before the regular mills do, but the total tonnage from that source won't be large.

Some smaller consumers interviewed by STEEL are worried that open-ending will put them at a disadvantage when competing for what's available with automotive and other large consumers. But even they hail the move by NPA as a sound one.

Steel Imports Wither as U.S. Supply Eases

Japanese and European steel producers are in tight competition for the shrinking U. S. steel import market. The biggest attraction of foreign steel, availability, is fading

THE JAPANESE pose a definite threat to Europeans trying to sell their steel to the U. S. In fact, Japanese steel imports into the U. S. have outranked European shipments for the last three or four months. Most of the Asian metal goes into the West Coast area.

But, the entire shipments from both sources are so small currently that neither one is causing a ripple in the domestic market. And market conditions dictate a further decrease in imports following the trend which began more than a year ago (see the chart).

Attractive — Expanding U. S. steelmaking facilities, closer balance between supply and demand in this country and the price advantage of domestic steel all contrive to minimize the lure of foreign iron and steel products. The main attraction of foreign steel is its availability for fill-in or spot requirements. Even though both European and Japanese steel prices have been sliding downward since the steel strike last year (European prices went down about $10 a ton on many products in fourth quarter, 1952), American manufacturers prefer to wait for domestic steel if they can get delivery in a reasonable period.

However, the possibility of further price rises on domestic steel and continuing shortages in local areas encourage importers. On the East Coast, plates and wire from Europe can be had within six weeks; cold-rolled sheets in six to eight weeks; merchant bars and deformed bars in six to eight weeks and structural channels in about 16 weeks.

Underselling—At Providence, R. I., foreign pig iron, basic grade, is being offered under the domestic price at $58 per ton. More Swedish steel and rods are being bought for light, high quality applications, including music wire. That's true also of razor blade stock in which both Swedish and British (Sheffield) stock is moving at three to four cents a pound under domestic prices.

In the Pittsburgh area, deliveries are 45 to 60 days on Japanese plates, mostly in the 1020 clad grade. Recently a general offer was received by one importer in Pittsburgh from Belgian steel mills.

Handicapped Race Japan has exported a large volume of steel casing and line pipe to the Gulf Coast market in the last two or three years. Delivery ranges from 4 to 6 months. That has helped the Japanese remain competitive with European suppliers although the Japanese must operate under a freight handicap—$29 a ton from Japan to the Gulf and $19 a ton freight from Europe to the Gulf.

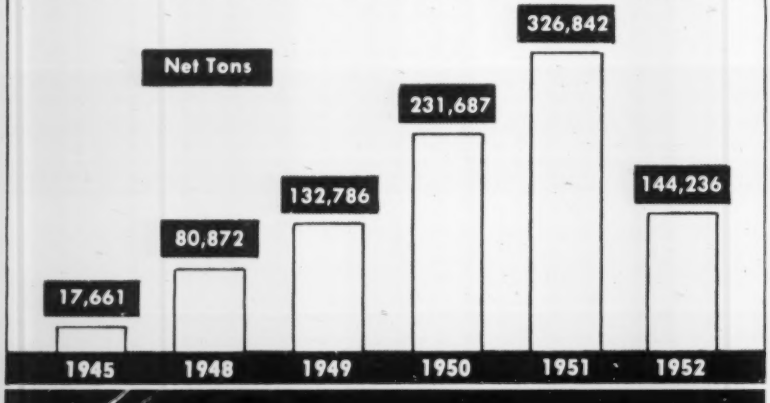
On the West Coast, where the Japanese have made their deepest inroads into European traffic, they promise deliveries ranging from 30 days to 3 months depending on the product. Delivered prices on bars and plates are equivalent to Pacific Coast warehouse prices with duty paid, specialty items prices range 10 to 30 per cent above local warehouse costs. The import duty amounts to about 10 per cent.

Quality Spread—Japanese quality is generally good on sheets, very good on plates and poor on nails. Japan can and has produced API pipe and casing with Moody's inspection, also Lloyd's ABS ship plates with mill certificates.

Both the Japanese, whose trade with the U. S. was recently running at annual rates of $700 million in imports and $200 million in exports, and the European countries, whose mills in many cases are order-starved (see p. 61), have incentives for courting exports to the U. S. iron and steel markets. But only more sizable price rises on domestic steel or another prolonged steel shortage, will give them the opening they seek.

IRON & STEEL PRODUCT IMPORTS

Excluding Advanced Manufactures—Monthly Averages



Source: U.S. Office of Business Economics. 1952 figures estimated by STEEL

"I have been predicting capacity operations in the steel industry, and I so predict for this year"

AVERY C. ADAMS
President
Pittsburgh Steel Co.

"FOR THE PAST ten years, I have been predicting capacity operations in the steel industry, and I so predict for this year."

With that prognostication, Avery C. Adams, president of Pittsburgh Steel Co., Pittsburgh, opened a talk before the New York Society of Security Analysts in New York on Feb. 19. He's one of the first steel executives to predict capacity operations for the full year. Among the problems of the steel industry, Mr. Adams discussed the questions of excess capacity and breakeven points.

Growing Appetite—"There is no reason to assume that the demand for steel in the future will not bear the same relationship to such factors as Gross National Product, increases in population and increases in consumption of steel per capita as in the past, and if this holds true, then the expansion of the steel industry's capacity has been projected in a realistic manner," he said. The country's demand for steel, based on population growth and increased per capita consumption, has been equal to an additional 49 million ingot tons a year for a total of 110 million ingot tons a year over the period from 1919 to 1952. A further increase of 20 million ingot tons is estimated by 1962.

While breakeven points vary from month to month and are, therefore, "meaningless," Mr. Adams pointed out Pittsburgh Steel's "breakeven point in 1952 was 55 per cent of capacity in terms of tonnage." In 1931, certain companies broke even at an operating rate of 38 per cent of capacity, he said. Despite that rise, Mr. Adams believes when the going gets tough the steel industry will find ways and means of cutting costs. "I think it is significant to observe at this point that no integrated steel company has ever gone through bankruptcy."

Growing Market—In regard to Pittsburgh Steel Co. itself, Mr. Adams said his company's expansion plans will enable it to increase finishing capacity by more than 80 per cent in the period from Jan. 1, 1951, to Jan. 1, 1954. Included in the expansion is a new continuous 66-inch hot and cold-rolled sheet and strip mill, to help Pittsburgh meet demand for what Mr. Adams described as "the fastest growing product market in the industry."

More Oil Country Goods in '53

Oil country tubular goods will be easier to obtain this year because of a 35 per cent increase of facilities over the 1950-51 period, says NPA's Iron & Steel Division. The expansion will make available 22 per cent more goods than in the former period.

The division released figures based on a survey of the industry. When compared with the 1,625,000 net tons of oil country tubular goods produced in strike-torn 1952, figures in the table below take on added significance.

	1953	1954	1955
	(Figures in net tons)		
Old mills	1,896,000	2,131,000	2,183,000
New mills	194,000	504,000	564,000
Conversion	125,000		
TOTAL	2,215,000	2,638,000	2,747,000

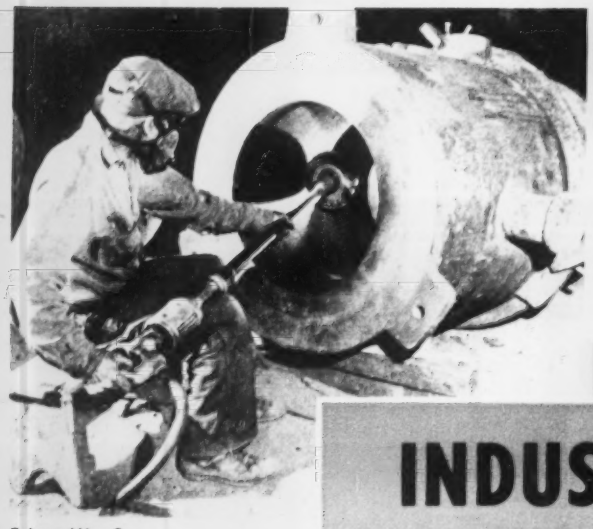
By 1955, production will have increased over 1950-51 output by about 51 per cent.

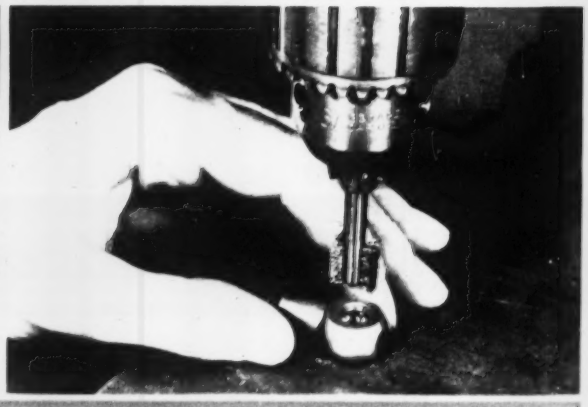
Petroleum Administration for Defense officials are enthused over the report, claiming that such production should permit domestic oil drillers to sink in the neighborhood of 50,000 wells a year in 1954 and 1955. That would be 4000 wells a year over the 1952 total of 46,000 reported by *Steelways*, official magazine of American Iron & Steel Institute.

Inland To Get Canadian Ore?

Inland Steel Co., Chicago, soon may conclude an agreement with Steep Rock Iron Mines, Toronto, to import Canadian iron ore. Clarence B. Randall, Inland's president, made the preliminary announcement although formal papers have not been signed yet.

Negotiations have been going on between the two companies for three years. Inland has sufficient ore resources "for a very long time," Mr. Randall said, but he believes Canada is a great potential source for future ore needs.





Osborn Mfg. Co.

INDUSTRIAL BRUSHES

Research finds new uses for brushes as production continues its steady gains. Manufacturers hope to surpass 1952 sales of $60 million

INDUSTRIAL BRUSHES are sweeping to high production levels. New uses and developments made brushes for industry a $60 million business in 1952.

Wider applications of brushes contributed to sales of more than $55 million in 1951, $49 million in 1950, as compared with $42 million in 1947. Steady increases in 1952 encourage industry members who generally expect high sales this year. Most manufacturers say they can handle more orders, however.

Equal Uses—Industrial brushes are divided about evenly in volume between power-driven brushes for production uses, brushes for paint and varnish and for maintenance. The proportion for production is steadily rising. Metalworking's expansion brings with it an increased demand for maintenance and painting brushes.

Power brushes for production contain large quantities of steel wire. Alloy wires, such as brass and stainless steel, are used in brushes for special applications. Metalworking industries are the leading users of power-brushes, accounting for about 30 per cent of total volume. These brushes are used for removing burrs and sharp edges, breaking corners and forming radii, removing scratches and tool marks, cleaning, polishing, removing paint and varnish and smoothing rusted and pitted surfaces. Among special uses mentioned by Fuller Brush Co., Hartford, Conn., are cleaning tin plate before coating and scrubbing and cleaning hot-rolled flat steel after pickling.

Brush Material—Aside from metal, brushes may contain bristle, fiber or hair. Natural bristle, from hogs, is in short supply as imports from China and Russia, the largest suppliers, have been cut off. Heavy duty brushes used to remove burrs from metal parts are made of fibers such as palmetto, bahia and tampico. Brushes for painting and varnishing have soft bristles of animal hair.

The best news in the brush industry is the ever-increasing uses of brushes by such heavy customers as the following industries: Aircraft, automotive, farm equipment manufacture and rubber goods. A Cleveland firm, Herold Mfg. Co., reports new developments such as wire buffing of gear teeth to take the place of sand blasting. Blasting took more time and was less healthful for the worker. Recently welding fabrications are brushed to remove excess oxide and to improve the metal's appearance.

New Uses — Growing in importance are stainless steel wire brushes where metalworking shops are fabricating that metal. Research has developed brushes for use in electronic equipment, while brushes with soft bristles are coming into increased popularity for buffing, polishing and finishing.

A major problem for brush manufacturers until recently has been obtaining wire and tubing for power brush cores. Supplies are more plentiful now, except for natural bristles for paint brushes.

Complicated Operation — An industry member, whose company makes 5000 types of brushes, pointed out a difficulty manufacturers face. There are so many applications of brushes that potential customers aren't familiar with all uses. Alert to this problem, leading companies such as Osborn Mfg. Co., Cleveland, are spending much time and money educating the public to the many possibilities of industrial brushes.

Hydropress Builds New Mill

A new type rolling mill for fabricating tapered aluminum alloy plates and sheets, such as those required for latest model military and naval aircraft, is being designed and built by Hydropress Inc., New York. The 145-inch four-

high rolling mill will permit hot or cold-rolling of aluminum alloy sheets and plates from 0.032-inch to 3.0-inch thickness. Operation is scheduled for late this year.

DSFA Reports Coke Progress

Industry is making progress toward meeting defense mobilization goals for coke and metallurgical coal, the Defense Solid Fuels Administration reports, but much new construction needed to meet the coke expansion goal remains to be completed. To prevent a coke shortage, DSFA is working to carry out the largest coke oven construction program on record.

A net gain of 3,468,000 tons in annual coking capacity was made in fiscal 1952, according to DSFA, which predicts a rapid increase in demand for coke in fiscal 1953.

During fiscal 1952, certificates of necessity for tax write-offs of essential coal and coke facilities were certified for 88 projects costing about $345 million. DSFA authorized and distributed controlled materials for 186 coal mine construction projects costing about $169 million during the same period.

Powder Metallurgy Expansion

American Brake Shoe Co., New York, will diversify its manufacture of powder metallurgy products. Four years of research preceded the company's entrance into that field. First products marketed were friction materials for clutch parts.

To carry out increased production, American Brake Shoe installed new production facilities in its Hillburn, N. Y., plant. The expansion will double present capacity.

Ford Buys California Site

Ford Motor Co.'s preparations for an assembly plant at San Jose, Calif., are rapidly taking shape. The company purchased a 160-acre site for the plant, to cost between $35 million and $50 million.

Capacity will be about 150,000 cars and trucks annually, to be distributed to 11 western states. Manufacturing space alone will occupy 1 million square feet. Officials say construction will start immediately.

Industrial Sales Growth Varies Widely

Makers of electrical equipment and autos do better than average, but steel and nonferrous producers slip below the norm. Federal controls cause some inequality

ELECTRICAL equipment manufacturers and auto producers had above-average gross revenue increases from 1941 to 1951, but the gross sales increase of iron and steel and nonferrous companies was below the average rise.

Those are among the conclusions of Fact Finders Associates Inc., a New York research firm, which surveyed 13 industries. The research is based on conclusions from tax payments and corporate revenue of 155 companies in the 13 industries (see the accompanying tabulation).

At the Top—Topping the list in growth was common-carrier trucking which increased gross revenues 408.75 per cent, more than three times that of the iron and steel industry. Truckers' taxes in 1951 equaled only 6.83 per cent of revenue received.

The favored position of trucking relates to the fact that trucks have been assisted in their growth through use of public highways. "Because of public contributions to the costs of streets and roads it uses, trucking must be considered the only industry among those studied which does not finance its plant," Fact Finders Associates declare.

At the Bottom—Three industries railroads with 97.5 per cent, public utilities with 96.54 per cent and nonferrous metals with 93.19 per cent had gross revenue increases of less than 100 per cent for the surveyed period. Fact Finders attributes this to "excessive government regulation and controls."

"The railroads and public utilities," it reports, "have not had as much opportunity as other businesses to increase their sales by expansion of plant facilities, nor have they had as much chance to adjust prices to meet inflated costs, because rates are under federal regulation. Nonferrous metals, such as copper and nickel, are largely imported, and both their importation and their domestic production are under government control."

	INDUSTRIES	Gross Revenue Increase 1941-1951	Tax % of 1951 Gross Revenue	Sales or Gross Revenue in millions of dollars 1941	1951
ABOVE AVERAGE	Common-Carrier Trucking (23 companies)	408.75%	6.83%	$ 73	$ 370
	Electrical Equipment (3 companies)	240.42	15.46	1058	3600
	Miscellaneous Mfg. (24 companies)	229.79	12.76	1116	3681
	Rubber & Tire Mfg. (7 companies)	218.85	14.58	1197	3817
	Auto & Truck Mfg. (4 companies)	205.09	13.48	3508	10,702
	Communications (5 companies)	180.97	17.25	1299	3649
	Chemical Products (5 companies)	172.63	16.78	810	2209
	Food Products (9 companies)	161.10	3.04	2831	7391
Average Gross Revenue Increase		**155%**			
BELOW AVERAGE	Retail Trade (9 companies)	142.83	5.30	3502	8503
	Iron & Steel (8 companies)	119.35	12.98	3776	8283
	Railroads (24 companies)	97.50	10.43	3703	7313
	Public Utilities (25 companies)	96.54	21.81	1352	2656
	Non-ferrous Metals (5 companies)	93.19	16.94	572	1104

The SS *Evanthia* takes on its first load of ore as . . .

Kaiser Opens Jamaica Bauxite Facilities

BAUXITE from the $12-million Jamaican mining operations of Kaiser Aluminum & Chemical Corp. is now being used in the company's processing plant in Baton Rouge, La. The *SS Evanthia* took on a 10,000-ton load of ore at Port Kaiser, Jamaica, on Feb. 11 to mark the formal opening.

One of the knottiest problems to solve to make the opening a reality was getting the ore from the initial mining areas to the port, only 13 miles away. The southwest coast of Jamaica is fringed by a 500-foot limestone cliff laced with faults caused by earthquakes. Engineers of Kaiser Engineers division of Henry J. Kaiser Co. decided on a standard gage railroad. About 425 tons of dynamite were used in excavating 600,000 cubic yards of rock for the road bed.

Other Facilities — The Jamaica project also includes a 995-foot pier, ore handling equipment and drying and storage facilities at Little Pedro Point. Annual capacity will be 2 million tons of bauxite.

Kaiser Aluminum & Chemical has rights to 19,000 acres of bauxite on Jamaica, enough to supply its needs for about 50 years. Formerly, the company used ore from South America.

Costly—The new ore is enough different from the old to necessitate a $23-million expansion and remodeling project at Baton Rouge. That increased the plant's alumina capacity to about 800,000 tons a year. Kaiser's Chalmette, La., and Mead and Tacoma, Wash., primary aluminum plants get their alumina supply from Baton Rouge.

When the over-all expansion program is completed, the cost will be about $200 million and Kaiser Aluminum & Chemical's annual aluminum capacity will be more than 800 million pounds.

Contract Spurs Copper Mining

About 230 million pounds of copper will be recovered from an undeveloped deposit of low-grade ore in the Globe-Miami mining district of Arizona as a result of an agreement announced by the Defense Materials Procurement Agency. Miami Copper Co., at its Miami, Ariz., mines, will produce refined copper at a price of 27.35 cents a pound.

Development of a new ore bed will cost Miami $3 million. Production should be underway in the first half of 1955, and the mines are expected to yield considerable molybdenum aside from the copper. The contract runs to June 30, 1962, but Miami reserves the right to cancel if its project loses money and the losses reach a stipulated point.

Aluminum from Abroad

NPA decision and promise of 60-day delivery spurs imports of aluminum mill products

THE PROMISE of 60-day delivery on imported aluminum mill products at no price premium is proving attractive to a number of U. S. fabricators and warehouses. Because orders placed with American mills carry a third quarter delivery tag for most products, an estimated 2000 tons of these products, principally sheet and coils, are imported monthly.

Sellers absorb tariffs varying from 3 cents a pound on sheet to 22.5 per cent on forgings. Great Britain is the principal exporter.

NPA Ruling — NPA's decision that imported material need not be deducted from CMP allotments furnished the incentive to seek supplies abroad.

Chief importing companies representing mills abroad indicate that flat sheet and coils are the chief tonnage items in demand.

Estimate Imports — Aluminum Import Corp., New York, distributor for the Aluminium Ltd. group, says sales of semi-fabricated products here over the past six months total about 10 million pounds. Delivery runs from 8 to 14 weeks and chief products sold are sheet, rod and some forgings for aviation use.

Aluminum Import, careful to point out that its interest in the American market is as an independent ingot supplier, stresses that it's only helping out customers on a spot basis. It believes the import market will dry up when U. S. mills catch up with backlogs.

Continuing Competition — While some firms regard the import boom as temporary, others feel they can meet U. S. prices on a continuing basis. One of the latter is E. Taranger Inc., New York, representing an English and an Italian company.

Canada Changes Alcoa's Plans

Aluminum Co. of America's proposed Taiya, Alaska, aluminum plant may come to life in a different manner than expected, with Canada supplying all electric power to the company rather than allowing Alcoa to utilize Yukon river water independently.

College Grads at Premium

Fewer seniors and more jobs mean that an already big problem will get even bigger

COLLEGE graduates will draw a premium price on the industrial market in 1953, if for no other reason than they are hard to find. Add to that the fact that wage controls have been removed, and you have the setting for a mad scramble on the college campuses next May and June.

A survey by the National Industrial Conference Board indicates that fewer men students will be graduated from American colleges in 1953 than in 1952. But at the same time, officials of 195 leading companies surveyed stated they will want more degreed men to fill their job openings. Last year, the average manufacturing company hired 60 graduates; this year that same company wants 70.

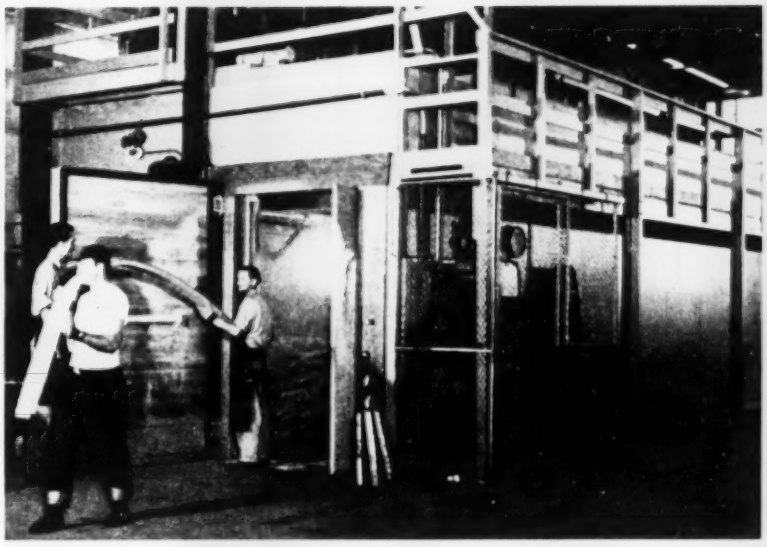
Not Available—But that many men are not available. In addition to fewer students, it is estimated that 25 per cent of the male seniors have not completed their tour of military duty. To make the situation even more acute, more companies than ever are getting into the race for the campus-bred man.

The only encouraging aspect of the male shortage is that some eligible men will be released from the armed services. Some of them were recruited two or three years ago and have business experience.

Price Tag—There is no doubt about the value of the college degree anymore. This year, the price tag in a manufacturing concern will range from a lofty monthly average of $488 for a Ph.D. down to a respectable $308 for a regular bachelor's degree. Engineers, who will be the most sought after of all, will draw an average of $334 a month. Nonmanufacturing salaries will be slightly lower.

In order to get what they want some companies are hiring 1953's graduates before they ever leave the halls of ivy. Others withhold a definite offer until the prospective employee has a chance to see the company facilities and some of the executives. But the report shows that 90 per cent of those surveyed are holding to established methods of careful selection, despite the pressure to do otherwise.

Sans Pessimism—Not to be dismayed by all this, most of the reporting companies feel that by increasing their efforts, they can obtain the number they need. There isn't exactly optimism about the situation, but neither is there too much pessimism.



Deep Freeze Stores Airplane Parts

Meat and vegetables have no monopoly on the use of deep freeze boxes, as this picture at Lockheed Aircraft Corp., Burbank, Calif., shows. The 40x12x10½ box is used to preserve airplane parts between steps in their manufacture. It can cool 2500 pounds of aluminum from room temperature to minus 20 F within two hours. Quick freezing delays age hardening after heat treating processes

Better Balance in Labor Supply

Labor supply in January was in better balance and job opportunities more widely distributed than a year ago, says Secretary of Labor Martin P. Durkin. That's based on a survey by the Bureau of Employment Security and state employment bureaus in 182 major labor areas of the country.

Results of the survey showed 4 areas with labor shortages; 79 with balanced labor supply, compared with 51 a year ago; 81 with moderate labor surpluses, compared with 100 a year ago; and 18 with substantial labor surpluses, fewer than at any time since March, 1952.

Manufacturing employers in 108 of the 182 major areas surveyed predicted a continuing rise in need for workers to March of this year. In about half of these areas, only slight gains were anticipated.

Decontrol Accelerates

The Office of Price Stabilization took the price lid off thousands of more products last week

OPS put out seven orders decontrolling prices on thousands of products on Feb. 18. Of primary interest to metalworking executives are Amendment 41 to Regulation 9 and Amendment 16 to Revision 1 of GOR 5, both effective Feb. 18.

Items decontrolled by those actions include:

Heavy machinery, such as construction machinery and equipment; certain other machinery and equipment including locomotives, railroad cars, mine cars; materials handling equipment; elevators, escalators; mining, quarrying and oil field machinery and equipment; cotton ginning machinery; food products machinery; ore crushing and concentrating machinery; industrial and laboratory furnaces and ovens, except coke ovens; rolling mill machinery; farm machinery and equipment and textile machinery.

Automotive equipment, like fire trucks, hearses, ambulances, trailers, motorcycles, motor scooters

NEA

Gets Into the Act

Joseph Freehill, a little-known official in Washington until he was made price stabilizer, got into the act in a big way when he started carrying out administration orders to bring an orderly end to price controls by Apr. 30

but not motor-driven bicycles nor passenger automobiles.

Hand tools.

Business machine equipment and accessories; counters and computers.

Refactory products and non-metallic building material.

Lumber and wood products; coal and all other solid fuels and coal chemicals.

Manufacturers' sales prices were also freed on thousands of consumer items, previously decontrolled at the wholesale and retail levels, such as housewares, radio and TV parts, small electrical appliances, power lawn mowers, but not refrigerators, home and farm freezers, dishwashers, ranges, washers, dryers, ironers, food waste disposers or water heaters.

Industrial and commercial services were freed, except those involved in the production of commodities remaining under price control.

All transporation services were decontrolled including rental of automotive and other transportation equipment; warehousing, storage and dock and terminal services.

CHECKLIST ON CONTROLS

Materials Order

BRASS MILL PRODUCTS—Amendment of Feb. 16, 1953, of NPA Order M-82 permits distributors of brass mill products to place orders for replacement of inventory as soon as deliveries are made by the distributors rather than waiting until the succeeding calendar month to place such orders. It was effective Feb. 16.

Controlled Materials Plan

CONVERSION STEEL—Direction 19 to CMP Regulation 1 and Direction 7 to CMP Regulation 6, both issued and effective Feb. 12, 1953, extend through second quarter, 1953, authorization to purchase carbon conversion steel on an ex-allotment basis by manufacturers of Class A and B products containing steel.

UNRATED ORDERS—Direction 20 to CMP Regulation 1 and Direction 10 to CMP Regulation 6, both issued and effective Feb. 16, 1953, permit controlled materials producers to accept unrated orders for controlled materials after the beginning of lead time, calling for delivery after February, 1953.

Price Regulations

DECONTROL—Effective Feb. 13, 1953, the Office of Price Stabilization issued a number of communications decontrolling many items affecting the metal working industry. Included are: All rubber products; all scrap and secondary metals; castings and forgings; construction services; rentals of most industrial machinery and equipment; prefabricated housing; lead, zinc, tin and most minor metals and minerals; paints, varnishes and lacquers; iron ore; petroleum, gas and products, including lubricating oils; collapsible tubes; and metal cap closures. Items decontrolled effective Feb. 18 include: Coal and all other solid fuels; commercial and industrial services; transportation and related services; manufacturer's sale of thousands of consumer item such as housewares and radio and TV parts; miscellaneous consumer durables such as business machines, equipment and accessories; nonmetallic building materials; refractory products; farm machinery and equipment; certain automotive equipment; construction and certain other machinery and equipment; and industrial, scientific and technical glass products. Businesses affected by these orders are required to keep available for inspection whatever records were required by the regulations.

IRON, STEEL PRODUCTS—Amendment 5 of Supplementary Regulation 100 of General Ceiling Price Regulation, issued and effective Feb. 12, 1953, gives producers of iron and steel products the option of rounding their ceiling base prices and extras and deductions expressed in dollars and cents per unit rather than rounding total prices.

PRIMARY NICKEL PRODUCTS — Amendment 1 of Supplementary Regulation 33 of General Ceiling Price Regulation, issued and effective Feb. 13, 1953, permits all sellers of primary nickel products to increase their ceiling prices 3.5 cents per pound.

BERYLLIUM COPPER BASE ALLOY —Supplementary Regulation 133 of General Ceiling Price Regulation, issued and effective Feb. 13, 1953, authorized a ceiling price increase for producers of beryllium copper master alloy. It amounts to about 11 per cent over the price established under GCPR.

RAIL, TRACK ACCESSORIES — Amendment 1 of CPR 186, issued and effective Feb. 16, 1953, postpones indefinitely the effective date of the regulation, which covers sales of relaying rail and used track accessories.

Appointments in Washington

Dr. James Bliss Austin, director of research and chief of United States Steel Corp.'s research laboratory at Kearny, N. J., was appointed chairman of the Committee on Chemical Warfare of the Research & Development Board, Department of Defense.

Ralph S. Trigg, formerly the acting administrator of the Defense Production Administration, was named assistant director for production of the Office of Defense Mobilization.

James F. Brownlee, a general partner of J. H. Whitney & Co., New York, was appointed as a consultant on economic controls for the Office of Defense Mobilization.

Brig. Gen. Bernard L. Robinson, recently appointed Army Assistant Chief of Engineers, will serve also as chairman of the Board of Engineers and Rivers and Harbors.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Lathes, Toolmakers	Gorton Howell Machinery Co., Tulsa, Okla.
Lathes, Chamber-Boring	Lehman Machine Co., St. Louis
Trucks	Chrysler Corp., Detroit
Tank & Combat Vehicle Parts	Grote Mfg. Co. Inc., Bellevue, Ky.
	Eaton Mfg. Co., Massillon, O.
Aircraft Maintenance Parts	United Aircraft Corp., E. Hartford, Conn.
Carburetors	Bendix Aviation Corp., Detroit
Shafts & Actuators	Eastman Machine Co., Buffalo
Tanks, Aircraft	Butler Mfg. Co., Kansas City, Mo.
Electron Tubes	General Electric Co., Schenectady, N. Y.
	Raytheon Mfg. Co., Waltham, Mass.
Bombs, 100 lb.	Temco Inc., Nashville, Tenn.
Shells, 105 mm.	Geo. D. Roper Inc., Rockford, Ill.
Shells, 90 mm.	United States Steel Corp., New York
Shells, Mortar	Lehigh Foundries Inc., Easton, Pa.
	Scaife Co., Oakmont, Pa.
Primers, Percussion	Montague Rod & Reel Co., Montague City, Mass.
Fuzes	Eastman Kodak Co., Rochester, N. Y.
	Precision Castings Co. Inc., Fayetteville, N. Y.
Boosters	Warren Webster & Co., Camden, N. J.
Metal Tables, Bedside	Joseph Turk Mfg. Co., Bradley, Ill.
Electric Fans, Desk & Wall	Emerson Electric Mfg. Co., St. Louis

PUBLIC AND COMMUNITY RELATIONS
First of a Management Series

How Industry Can Be A Better Neighbor

UNDER PRESSURE of defense orders, a midwest forging company scheduled a third shift at night. Within a week the plant had received nine telephone calls, three threatening letters and four delegations of irate citizens protesting the noise when the people in the neighborhood were trying in vain to sleep.

Realizing that the work had to be done, the company president ignored the letters, had the sales manager cursorily explain to the protesting delegations and made it clear to his secretary that he would take no more phone calls from anyone suspected of having a gripe.

Within a fortnight the company found itself the subject of a series of newspaper articles about industrial nuisances. Threats were made in the city council to rezone the district. The firm finally realized that action was necessary.

It hired acoustical engineers to see what could be done about the noise. It hired trained public relations men to see what could be done about the community's attitude toward the plant.

The public relations men had the answer. A plant tour was scheduled to show the community that the firm was working on defense goods. Showing the nature of its operations explained to people who had thought the plant was wantonly noisy just what was causing the noise. Finally, showing what the acoustical engineers were doing at the company's expense to help cut down the noise in every way possible clinched the case. The neighbors stopped complaining about the plant.

That company managed to repair its community reputation. A dramatic situation forced it to. Maybe your reputation is just gradually eroding away without your realizing it. Do you know the components of good public relations? Do you know how to go about setting up a program to get good relations? The boxed-portions on the next seven pages can get you started. If you're already started, the checklists can help you determine if you're doing a good job.

Sell the Program

If you already have a public relations department, better check to see that it conforms to these basic practices. If you haven't one, here's how to get started.

Establish policy. Base your whole approach to public relations on the knowledge that your company exists through service to its customers and to the community. Service with its counterpart, sincerity, constitutes the underlying orientation that must support your public relations program.

Select a policy-level executive to assume responsibility for your public relations program and to handle requests for information from outsiders.

Determine how people feel about your plant through unsigned questionnaires and interviews with community leaders. Encourage criticism to find out how you really stand.

With this knowledge of what your special job is, decide how much money is warranted and where your most important work lies.

Determine the best approach to the job with the money available. Big corporations each spend millions. Your job may require only a couple of hundred dollars.

You may wish to call in a public relations firm, particularly if you have a heavy attitude-repair job to do. Often your public relations can be best handled by a permanent employee or department, kept on the right track by occasional outside counsel.

A Matter of Reputation

Your reputation is important in the community. But the reputation of the thousands of plants in the thousands of communities throughout the nation is the reputation of industry—the reputation of free enterprise.

No stranger to "selling" free enterprise is management. It is estimated that the free enterprise selling job accounts for over $100 million of industry's ad budget annually, not to mention an unknown but sizable amount of its employee-relations expenditures. The theme has been hawked in every medium and mode the modern selling world can devise. But there are serious doubts as to whether the word is getting through.

"We of the industrial and business world deceive ourselves that we can 'make friends and influence people' through such things as paid newspaper advertising, pamphlets and billboards," says Standard Oil of New Jersey's Frank Abrams. "Some of that may help under certain conditions, but when it becomes the main channel of our effort, I think it is almost an insult to the intelligence of the average reader."

Paul Garrett, General Motors vice president, puts it another way: "Public relations must start not with what people ought to think, but with what they actually do think. . . . The most obvious lesson any company can learn, and seemingly the most difficult, is that good relations outside grow from good relations inside. If there is any secret to success in building good public relations, it is that you must begin at home and work from the inside out. Begin in the plant if you want to be well thought of in the plant community. Begin in the plant community if you want to be well thought of over the nation.

"Businesses—big and small alike—must plan their course mindful that their existence is of the consumer, by the consumer and for the consumer."

That is the heart of forward-looking public relations: If you want to be known as a good neighbor, be one. Communications fences must be torn down between your plant and the community. People

Do Your Part

Remember that definite identification with small specific groups in the community is most significant. Small company support of large causes can be lost in the shuffle.

Has your plant given tangible evidence of its desire to boost and build the community?

Does your plant give active support to welfare drives?

Does your plant sponsor activities in the community?

Are your personnel active leaders in civic groups in the community?

Junior Achievement of San Francisco Inc.

believe what they see or what they hear from friends, but the bombardment of advertising has taught them to suspect what they hear in mass communication media. Why would management promote the free enterprise system in the newspaper, they ask, if what the union men tell us in person is not true?

Your New Public Relations

In Republic Steel Corp.'s Canton, O., plant when a disgruntled worker was told to hurry, he snapped back: "Why should I knock myself out for Republic? They make $75 out of every billet of steel and I get 75 cents." But his foreman, Chris Cutropia, was forearmed by classes in basic economics. He took the worker aside and convinced the griper that the company would be lucky to make 75 cents a billet. Reporting the incident to his superiors, Foreman Cutropia added, "Three months ago I wouldn't have been able to say anything." That's a working introduction to a plan to sell free enterprise that companies like Republic Steel Corp., Clevite Corp., Weirton Steel Co., General Electric Co., Chrysler Corp. and others are finding really pays off.

Courses teaching foremen and workers how to read a company balance sheet, how company income is distributed and the basic facts of our economic system have grown ten-fold since 1945 and they're increasing rapidly. Their popularity with the workers is attested by the fact that attendance seldom falls below 90 per cent though the courses are voluntary.

Worker awareness of costs contributes directly to savings, say many firms with the programs. But from the community relations standpoint, most significant is the fact that workers gain an understanding of the way business works and tell their friends what they know. That's the kind of free enterprise "selling" that really works.

Clevite Corp., Cleveland, also has added an adjunct to its economic education program that other firms not doing so might well follow. Each year every employee is provided with a wallet-size card containing such company statistics as wages and salaries, sales, profits and dividends. The cards are highly popular and are frequently referred to in discussions with family and friends. A bar-stool argument over corporation wealth is quickly settled when the facts are at hand. Most important of all, the company makes it quite clear that it has nothing to hide from its employees.

Getting the Leaders

But that's only part of the way the word is being spread. Modern public relations is aiming most carefully at the thought leaders in the community expending its ammunition where it will do the most good. Since the people in the accompanying list mold the thinking of the people in their communities, many firms are putting them on a regular mailing list of information about the plant and its economic and social role in the community. These releases are designed to keep the thought-leaders informed. Their impact isn't weakened through commercialism and corporate-egoism.

Speakers' bureaus of companies like American Steel & Wire Division, U. S. Steel Corp., are also doing a fine job of spreading information about subjects of general interest with a minimum company slant. Lists of the speakers and their subjects are sent to civic clubs and other community organizations. The topics are timely and

Chevrolet

Keep a Clean House

Presenting a good appearance is as important to your community status as to customers' opinions of you. A slummish plant cannot be a good neighbor.

Have you taken steps to eliminate so far as possible nuisances like smoke, odors and careless disposition of waste material?

Are scrap or stock piles enclosed to sustain the good appearance of the plant and prevent injury to children who might be playing in the area?

Could your plant be landscaped to present a more pleasing appearance?

How long ago was your plant building cleaned or painted? Would a coat of paint or a slight modernization make it a stronger asset to the appearance of the community?

handled by company men in the field. Accountants can talk about corporate finance or the implications of the national debt. Sales officials talk about the economic role of the company's product, what it means to the listener. Corporate industrial relations men talk about the implications of labor moves. Such talks, if timely and objectively presented, give the audience a favorable impression of management, the firm and the economic system it represents.

Public relations has been defined as "the mass production of favorable attitudes." Production of favorable attitudes means more than merely giving people information, though it may be friendly and sincere. Look at it this way: When it comes to evaluating your own neighbors, you judge them not only by the friendly chats you have over the back fence, but by the things they do. You note the manner in which they care for their homes, the part they play in community life and their willingness to lend a helping hand.

Industry is known to most people in the community as "the buildings with the fences around them." Business its structure and its problems must be humanized. They must become as much a part of the community as the storekeeper. Does anyone complain if the appliance dealer makes 10 per cent profit on his sales volume? No, because the people know and understand him and his operations. If he gets rich he's just a good businessman. But let industry make a profit of 10 per cent and many in the community are up in arms. Industry is a smoke-belching, noisy monster that steals the workingman's dollars to make a few bosses rich. The new stove or automobile at ever lower cost is somehow a product of the showroom and not of the plant.

Invite the Public In

That's why the plant tour is outstandingly important to every plant. If you had a friend who never invited you out to his house, you'd suspect he wasn't really your friend or that he had something to hide. Your friends in the community feel the same way. They're curious about what goes on in your plant. Seven out of ten people say they'd like to see what goes on in plants in their community. Eight out of ten people who have been on a plant tour say they'd like to *come back again next year.* The backdrop of equipment captures and holds the visitor's attention and enables management to give him facts about itself in a way he cannot doubt—he has seen for himself.

Here are some points you'll want to consider in planning your plant tour:

Evaluate Purpose — Don't do all things for all people in one tour. Decide just what the tour should do and whom it should reach.

Publicize Widely — Newspaper, radio announcements and post-

ers are effective in community-wide tours. Invitations with r.s.v.p. enclosures serve well for smaller groups and aid in planning refreshments, number of guides required, etc. Directions for reaching the plant should be included.

Provide for Comfort—Make adequate arrangements for parking well in advance of the tour and mark clearly. Rest rooms should be clearly marked. Provision should be made for supervision of small children if necessary. Invited or not, they often arrive with their parents.

Plant Route — If possible, the route of the tour should follow a logical sequence of manufacturing, or from simpler operations to more complex. Try to give the tour a logical meaning so that visitors can integrate what they learn. If there are danger areas, plan the route to by-pass them. Rope off oily stock or other things that might soil Sunday clothes.

Select Themes — Agree on a few main points that tell the story decided on. Keep them simple for a mass of detail confuses. Basic principles will stick.

Drive Themes Home — Repeat them at every appropriate opportunity along the route for repetition makes points stick, too. Tie your points into the tour in the guide's descriptions of equipment and through charts and signs where applicable.

Train Guides—Guides should understand thoroughly the purpose of the tour and the part they play in its success. The guide should have an easy, understandable and chatty talk prepared for each part of the tour.

Keep It Short, Friendly — Two hours is a maximum for sustained interest in the tour itself.

Be Dramatic — Use exhibits to clarify and interpret the plant and its functions. Don't rely on questions or guides' talks to tell the whole story. Use raw materials, parts and finished products to explain where your company's money goes, how it benefits everyone living in the community. Use sample advertisements and company customer activities to explain the import of your product.

Give Souvenir Booklets — Providing an attractive pamphlet covering the main points of the tour can serve two purposes: It will re-emphasize and fix in the visitor's mind the themes of the tour; and it may bring out points he missed during the excitement of the tour itself. He can show the booklet to friends, too, so the tour will get points across to people who didn't actually take it.

Important to bear in mind are these facts: *Cost* can be from virtually nothing to several thousand dollars, but cost is no index of success. An inexpensive tour

General Motors

Welcome Your Neighbors

Not ballyhooing free enterprise, but letting people know you're a friendly neighbor makes the best case for industry.

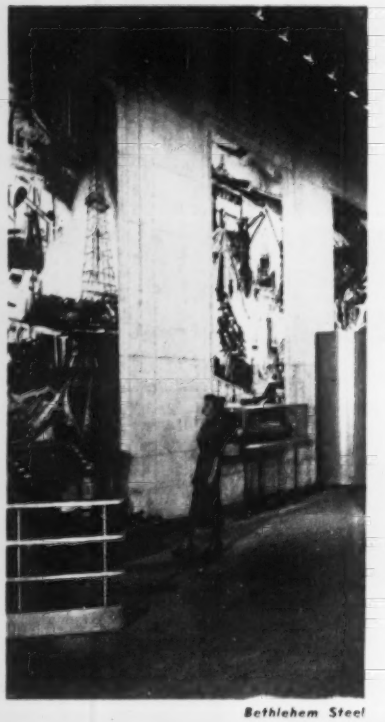
Is the community well acquainted with the products and services which your plant provides?

Have you conducted community visitors through your plant within the last year to show them what your plant does, why you're in business?

Are special groups such as civic officials, community leaders and business men familiar with your plant and its role in the community?

Has anyone from your plant spoken before a civic group within the past three months?

Have you prepared slides or movies available to the community to tell the story of your plant and what it does for the community and for its customers?



Bethlehem Steel

Help People Know You

Just giving the facts about your company is more effective than defensively berating critics. Some free enterprise advertising is an insult to the intelligence of the reader and he feels it's meant "for the people who don't understand."

Do your employees receive a history of the company and a statement of its policies when they are hired?

Do workers really know their fringe benefits? Ask a few, you may be surprised.

Are employees provided with answers to questions outsiders may ask them about the company pertaining to profits, sales, expansion programs and company developments?

Do your employees know how your company income is divided?

Are the people in the community aware of cost reduction in finished products and the higher standard of living your way of manufacture provides them?

Are leading citizens in the community on your mailing list so they'll be kept informed on company developments?

that has a unified theme can be much more successful than a Hollywoodish hodge-podge. *Community* open houses should be held at least every two or three years. Small groups may wish to go through your plant as often as once a week, but once you are set up to give them they'll require little expense or effort. Production will go up during plant tours, not down. Workers can't resist the temptation to show off just a little for their audience.

Being a Good Neighbor

But the plant tour literally opens just one door on the way to becoming a good neighbor. People pass the exterior of your plant every day. Is it as attractive as you can make it? Does it look like a good neighbor's residence should? How about noise and smoke? Have you done everything possible to eliminate these nuisances?

Many plants feel if they don't actually get complaints from their neighbors they are doing an adequate public relations job. But selling industry and free enterprise requires more than a lack of complaints. You don't necessarily like neighbors you don't complain about. To be sold in the community, industry must be liked.

Beyond the Minimum

If you're saying, "All this advice doesn't apply to me," let us assure you it certainly does. Business men who merely sit in their offices and gripe about the way things are going don't help matters a whit. Winning respect takes positive action and the people must be shown what industry has to offer.

The "good neighbor" theme is mirrored in miniature by the program of G. E.'s Carboloy Department, Detroit, when it built a new branch in Edmore, Mich. recently. First, store owners were asked how they felt about the new plant com-

These Are Community Leaders

Barbers
Beauticians
Business Men
Civic Officials
Clergymen
College Alumni Officers
Dentists
Doctors
Educators
Farm Group Officers
Fraternal Officers
Home Bureau Officers
Lawyers
Nationality Group Officers
Newspapermen
Nurses
Policemen and Firemen
Political Officers
Postmen
Professional Group Officers
Radio Stations
Service Organization Officers
Store Owners
Tavern Proprietors
Television Stations
Union Officers
Veterans Organization Officers
Women's Clubs
Youth Officers

Tell Your Story

Business language may not be dubbed an affectation by people in the community, but it's sure to confuse and weaken interest in what you're saying. Be sincere, be open and equally important, be understandable.

Do your statements to employees and the public avoid terms like—supply-demand imbalance, inventory adjustment, sales penetration, liquid assets, capital gains and unit cost reduction?

Are people told in dollars and cents what it means to each of them to have your plant as a producer and as a neighbor?

Do those from your company speak only before groups of other executives who already agree with the free enterprise message they're going to hear?

Are your talks illustrated with interesting and understandable charts?

Did you realize that most audiences feel they know just as much about free enterprise as you do? If you talk about people with socialistic ideas, you won't be talking to anyone.

Few Americans feel their ideas are socialistic.

Caterpillar Tractor

ing into the community. Their interest was aroused, they were made aware of its effect on their home town and they felt they were a part of getting the new plant to settle in the community.

Then post cards were sent to people in the community and nearby inquiring how they felt about the move and to make them part of the new plant's coming. As the plant was being built the people were kept advised as to how it was progressing. When the plant was nearly ready to go into operation, ads telling wages, benefits and other employment information were circulated in the local newspapers. The vast bulk of the employees were then hired from the Edmore area. When the plant had been in operation only a short time, an open house was held to show the whole community what was going on in the new factory. The turnout was overwhelming — 8000 flocked into the town of only 1500 population!

Now that the plant is in operation, a plant official speaks to civic groups often. Meetings of plant officials, civic leaders and business men are held regularly to discuss the effect of the plant on the community and also the effect of the community on the plant. As a result of such meetings, several building fronts have been repainted to make the town more attractive and a more adequate water supply has been instituted. An economics course is being sponsored by the plant in the high school. The plant is closed a week in the fall for the personnel to go deer hunting. The company buys local advertising, subscribes money to community drives and has provided a film library with a trained operator for civic groups.

In short, Carboloy's Edmore story is the story of adaption to the community; a story of business as a good neighbor; a worthwhile part of community life.

Republic Steel Corp. felt that economics as it's being taught in the colleges today lacked industry understanding. In collaboration with Case Institute of Technology, 50 professors of economics were gathered together to learn the points of view and operating problems of the men who have to meet payrolls. Guest experts lectured on such subjects as "Pension Programs and Capital Formation" and "The Position of Risk Capital." The lectures were followed by discussions in which the economics professors, the guest experts and management participated.

Then the economists went directly into industry. Here they traced a refrigerator back from the retail outlet through marketing, financing, advertising, production and finally to the raw materials. Executives of these 17 co-operating companies soon discovered that the professors had some sound ideas to offer management, while the economists began to get better insight into the pressures that surround

Every Firm Needs a Public Relations Program

- **"Public relations" is a lot more than a ten-dollar phrase for publicity. It's everything your company says and does. Publicity is just the tool for letting people know about it.**

- **What your plant does is just as important as what your public relations program says it does. To be known as a good neighbor you must act the part.**

- **After the community develops a favorable attitude toward your plant, community relations must be continued. You can't turn helpfulness on and off as you feel you need it.**

- **Public relations programs can easily cost more than they're worth. A public relations program that is not backed up by sound action is just so much hollow noise.**

- **Sound public relations arouse people's curiosity about your plant. People become interested in the company's welfare and respect the facts you give them.**

- **Worker opinions about your company's income are altered by the facts. Be open with your employees. They'll respect you for it and tend to help you when help is needed.**

- **Plants not making consumer items need public relations too. They must make people understand what their product is for in selling their plant communitywise.**

- **Good public and community relations are easier to achieve in a small plant. Big plants have more money, but the friendly environment of a small plant is a natural for public relations. Capitalize on smallness by developing the family atmosphere.**

- **Efficient public relations helps information seekers to reach top management. Public relations people do not need to have all the answers. Outside callers respect the firm more if they can talk directly to the person in authority.**

- **Plants can grow without a public relations program, but with community support, the path is much less rocky.**

management decisions which defy theory. Both groups benefited and a group of small manufacturers in Youngstown are pooling their efforts with a university there to conduct a similar program in the near future. Plants in your area can do it, too.

The summary of the professors, who knew the purpose of the program, is particularly timely. They report:

"Spend more time in civic affairs and less in country clubs. Stop talking to yourselves. By and large, people are not suspicious of the mechanical workings of capitalism, but they worry about the motives of management. Being exclusive tends to compound this suspicion."

The Chance Is Yours

"Now or never. . . " has bombarded management from the nation's editorial pages so heavily during the past 20 years that crisis is as regular as the morning newspaper — anticipated, acknowledged and used to wrap the daily garbage.

But with the election of Dwight D. Eisenhower, the first shouts of jubilation in victory were followed with the sobering realization that American business management holds the reins of its destiny. Editorial pages today are strangely quiet. Business is no longer on the outside looking in. It can no longer merely be against things. The role of critic is gone.

Henry Ford II, writing in the *Saturday Review* says, "This is an opportunity that we in business must not fail to meet. For years we have talked glibly of the superiority of the American way and of our ability, if given the chance, to correct many of the evils which beset us and the other peoples of the world.

"We have asked for the chance to show what we can do. Now we have that chance."

The chance is yours. What the nation thinks of free enterprise is what it thinks of every plant in every community. Your neighbors are the people who vote. Your plant is what they know about free enterprise.

The time for action is now.

Soaking Up Knowledge for Pakistan

Dr. Mir Asad Ali, right, of the ministry of industries, Pakistan, studies an open-hearth furnace at Phoenix Iron & Steel Co., Phoenixville, Pa., a subsidiary of Barium Steel Corp., New York. Dr. Ali is getting practical job training and technical knowledge to help him modernize the steel industry of Pakistan. Frederick Shoemaker, left, smelter foreman, explains the furnace operation to the visitor

Steel Supply Nears Balance in Europe

Production facilities continue to grow in Europe but orders are becoming harder to get. Loss of exports to the U. S. market is one sore spot

HOW SOON will European steel supply meet demand? That question is being asked often by European industrialists and some experts there predict it will balance by summer or, at the latest, early fall.

A quick look around the major European steel producing countries brings up these facts:

Balance—British steel output in 1952 at 18,059,000 tons was highest in history of the British steel industry. The country is rapidly nearing the point where it may find itself with more than ample supplies to meet its domestic and export needs, according to the British Iron & Steel Federation.

In Germany, backlogs of rolling mills and steel plants, generally, are shrinking. Foundries are noticing a large decline of incoming orders forcing shortening of working hours and in turn reducing orders for pig iron. Actual German steel production for 1952 was 17.4 million tons compared with 14.9 million tons the previous year.

Searching—Managers of Belgian and French steel plants are hurrying through Germany in order to place additional orders at any price. The Belgian steel industry is still busy, but it's only because of past orders. New orders are difficult to obtain.

Many western European steel mills are order-starved in the full meaning of the word. Complicating the situation is the lack of activity in the U. S. import market and increased competition from American mills (for more on this, see the story on p. 46).

The whole condition casts a pall on the Schuman Plan (now called the Montanunion). The Montanunion aims at increasing production by stepping up steel capacities. But, gradually becoming the biggest nonpolitical question of the union is: Where are the markets to absorb the more-than-51-million tons of present steel output within the participating countries?

Subsidize U.S. Competitors?

The question of how far the U. S. should subsidize foreign countries whose manufacturers can compete in the American market at prices below that of domestic producers was raised by H. E. Robertson, executive vice president of the Cast Iron Soil Pipe Institute at the annual convention of the Illinois Master Plumbers Association in Chicago.

Mr. Robertson endorsed the need for continued foreign economic aid but cautioned: "Whatever is done will require an intelligent, workable program, because of possible disturbing effects on our economy."

He told how some foreign soil pipe manufacturers, whose countries received American economic assistance, sold their products here below our prevailing prices, while selling them in their own countries well above these same prices. "Furthermore," Mr. Robertson said, "they had to absorb the freight charges for their pipe sold in this country."

Attack on Trade Barriers

"Let's give our (foreign) friends a fair crack at the American market."

So said Henry Ford II, president of the Ford Motor Co., at the annual winter meeting of the Inland Daily Press Association in Chicago.

Mr. Ford hastened to add one point: "I am not urging a course of action which I feel would benefit others at our expense. . . I am convinced that a considerable growth in our foreign trade—imports as well as exports—would be a continuing shot in the arm for our whole economy."

To implement such a plan Mr. Ford suggests we should: Write a new law without loopholes encouraging the rapid elimination of all possible tariffs; abandon completely the quota system; abandon the Buy American Act; and enact a workable law for simplifying the custom procedures.

Referring to the growing sale of foreign cars in the U. S., Mr. Ford said: "Ford Motor Co. . . . intends to meet foreign competition in the market place, not in the halls of the Tariff Commission. . . we ought to get rid of the 10 per cent tariff on cars at once."

Windows of Washington

By E. C. KREUTZBERG Washington Editor

GOVERNMENT OFFERS HAVE FEW TAKERS
. . . too many strings attached to appointments

Federal regulations prove severe to appointees from industry. The result is to discourage businessmen from filling government positions

UNLESS CONGRESS modifies the "conflict of interest" law, which prevents persons holding interests in a company from becoming officials of a department doing business with that company, it looks as though relatively few industrial leaders will be called into service of their country.

Financial Trimming — The financial sacrifices made by some Eisenhower appointees under this law do not encourage a yen for public service. Disregarding taxes they will have to pay as a result of divesting themselves of stock holdings, the four new Defense department heads are taking a terrible beating on income. For example, Defense Secretary Charles E. Wilson, who received $600,000 a year from General Motors now gets $22,500. His deputy, Roger M. Kyes, who drew almost $300,000 as a GM vice president, now gets $20,000 at the Pentagon.

If the case of Robert C. Sprague, reported in this column last week, proves a precedent, the Eisenhower administration will send to Congress no more nominations of business leaders who have interests in companies doing business with the government. When Mr. Sprague was nominated as undersecretary of the Air Force, his company decided that during his tenure with the Air Force it would not enter into any contracts with that service. At the same time, Mr. Sprague said he did not wish to dispose of his stock in the company.

Approval Promised — Mr. Sprague was assured that his company's decision to refrain from doing business with the Air Force would make it possible for him to retain his stock and win Senate approval of his nomination.

But the White House, having had its fingers burned in previous cases, decided to take no chances of stirring up public criticism on appointments of businessmen and withdrew Mr. Sprague's nomination

Cutting Federal Competition . .

Taking the lead in getting the government out of competition with private, tax-paying business, Rep. Fred E. Busbey (Rep., Ill.) introduced H. J. Res. 184.

This proposal would create a commission of 21 representatives of private industry to look over the 80 federal agencies engaged in direct competition with private enterprise, including about 40 which carry on lending and credit activities. "More than $12.5 billion in federal funds are invested in these lending activities, with additional commitments of more than $9 billion," said Mr. Busbey.

The resolution is aimed particularly at the publicly-owned power plants which represent an investment of $50 billion—more than twice that of all privately-owned utilities. But the resolution is all-inclusive; public housing, he said, constitutes unfair competition.

House action is paralleled by a Senate drive to put the Reconstruction Finance Corp. out of business by next Jan. 1.

To Discuss Grinding Methods . .

An important meeting to acquaint government officials with recently developed alternate processes for grinding tungsten carbide cutting tools is to be held Mar. 6 in Washington.

The meeting will climax a long campaign to reduce our dependence on imported diamond bort. Seven alternate processes are available, three of which will be unveiled at this meeting. Attendence, aside from the government experts, will be limited to companies and individuals experimenting with the alternate grinding processes, as well as those experimenting with cavity erosion.

Presiding over the meeting will be Herbert Newman who, as conservation officer in the NPA Metalworking Equipment Division, has had charge of the alternate grinding method drive. Work done to date not only assures less dependence on industrial diamonds in the future but will lead to faster and cheaper metal removal.

Outstanding feature of the meeting will be a report by Prof. O. W. Boston, University of Michigan, summarizing test findings on tungsten carbide cutting tools ground by the various alternate processes.

McKAY

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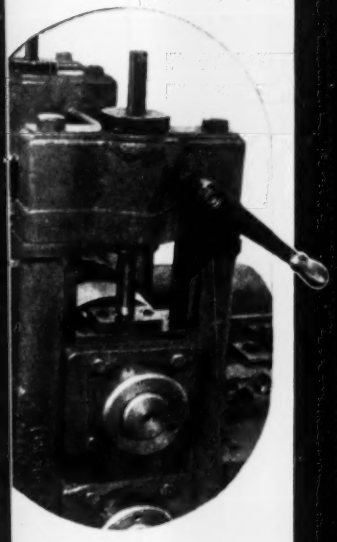
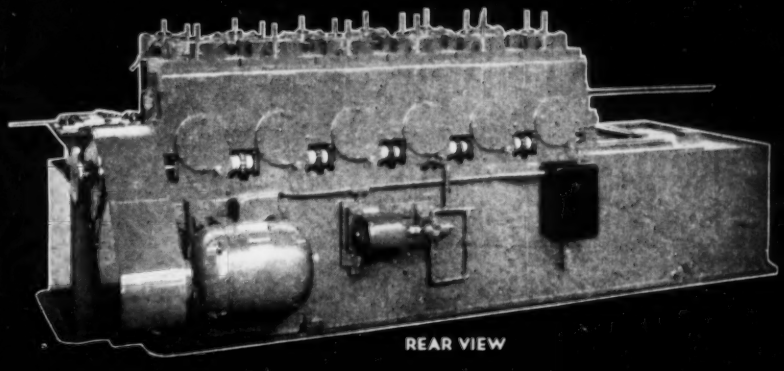
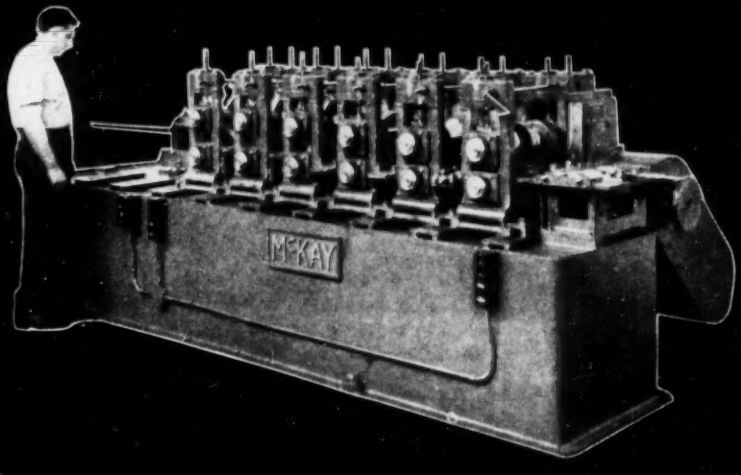


McKAY MICROMETER (patented)



REAR VIEW



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TYPICAL RUGGED McKAY CONSTRUCTION. Standardized units, choice of gearing, anti-friction bearings throughout, all gears between bearings. NOT OVERHUNG.

INTERCHANGEABLE GUIDING EQUIPMENT, easily adjusted, quickly removable.

MINIMUM CHANGEOVER TIME. All units engineered to allow complete roll change in shortest possible time.

LOW MAINTENANCE COST. All of the foregoing features, plus precision workmanship and up to the minute engineering, are a guarantee of low maintenance.

OPTIONAL FEATURES

BASE EXTENSION. Permits increasing the number of roll passes to meet future requirements, by the addition of standard housing units at a later date.

MOTOR DRIVEN COOLANT PUMP. Supplies flushing fluid to the rolls at each roll pass, and provides a rust preventative treatment to the formed strip. Tanks for fluid are built integral with the welded steel base

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TUBE MILLS

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ECTRIC RESISTANCE WELD
OXY-ACETYLENE WELD
TOMIC HYDROGEN WELD

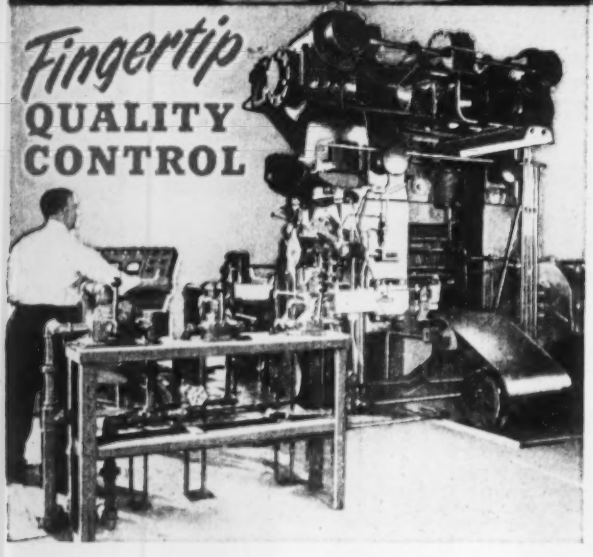
The McKAY MACHINE Company

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

PERFORMANCE RUGGEDNESS PRECISION AND SAFETY.

Complete Steel Service* from One Source



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Phone: TWinbrook 3-5000

PRODUCTION STEEL CO. OF ILLINOIS
2801 Roosevelt Rd., Broadview, Ill. (Chicago)
Phone: MAnsfield 6-4242

SENECA STEEL SERVICE, INC.
1050 Military Rd., Buffalo 17, N. Y.
Phone: Riverside 7920

SALES OFFICES:

PRODUCTION STEEL COMPANY
1002 E. 81st Street, Indianapolis, Ind.
Phone: Broadway 3468
E. W. Richardson, Sales Representative

PRODUCTION STEEL COMPANY
548 W. Mechanic Street, Jackson, Mich.
Phone: 2-9097
Glenn Christman, Sales Representative

PRODUCTION STEEL CO. OF ILLINOIS
7521 West Dixon St., Milwaukee, Wisc.
Phone: BLuemound 8-8323
Warren P. Bidwell, Sales Representative

SENECA STEEL SERVICE, INC.
739 Westchester Ave., Rochester, N. Y.
Phone: Culver 7480
W. J. Knoll, Sales Representative

SENECA STEEL SERVICE, INC.
1347 Northcliffe Rd., Syracuse, N. Y.
Phone: 73-5722
Dean Hethington, Sales Representative

SENECA STEEL SERVICE, INC.
347 Price Street, Jamestown, N. Y.
Phone: 5759
S. N. Olmsted, Jr., Sales Representative

PRODUCTION STEEL COMPANY
1040 High View Lane, Green Bay, Wisc.
Phone: Howard 7407
Tony Canadeo, Sales Representative

Small Hand Tools in Supply-Demand Balance

Tool kits bulge as skilled workmen buy more of their own small equipment. Few new models appear on the market as manufacturers standardize their lines to meet the growing demand

SKILLED WORKERS may be hard to find in some areas of the land, but the hand tools with which they work are in good supply, and the way it looks they will continue to be readily available for quite some time.

This industry, which produces the wrenches, pliers, screw drivers, chisels, snips, punches, steel tapes, and other tools found in the skilled worker's tool kit, is thriving right along with the rest of the metalworking economy. In 1952, it shipped at the clip of about $8.4 million a month. That was down slightly from the peak year of 1951, but still almost $2 million a month over 1950 and more than $3 million a month over 1949. And prospects are that 1953 will see another good year, with a decrease, if any, of only slight proportions.

Individual Growth — Illustrative of the rapid growth of the industry is one large precision tool manufacturer who recalls that in the 35 years since World War I, his company has increased sales by about 1500 per cent. Not all firms in the industry can show such a spectacular increase, but most have had a comfortable growth.

Reasons for the big market in hand tools are many. Of prime importance is the growing trend toward workers owning their own tools rather than using company-furnished equipment. The worker today has more money to buy his own tools than did the worker of a decade ago. He also takes greater pride in his tool kit.

Added Impetus—Another reason is that more men are becoming tool conscious, not only in the factory, but also in the home. Many of them learned how to handle tools while in the armed services, and they are continuing the skill on the family TV set, kitchen plumbing and automobile.

About 54 companies supply the needs of the hand tool market. That does not include such specialized equipment as micrometers, calipers and power tools. Some make complete lines, while others specialize. Most of the larger companies make their own components, but the smaller ones often depend on outside sources for such parts as gray iron castings, malleable iron castings, forgings and some of the rivets, bolts and nuts used in assembling.

Meeting the Demand—Although the demand for machinists' hand tools has grown so fast in recent years, the industry has had little trouble in meeting the demand, says George P. Byrne, managing director of Service Tools Institute, New York. In a period of critical shortage of machine tools and metals, manufacturers increased capacity enough to avert what could have been a serious hand tool shortage.

One reason for that is manufacturing processes have not changed greatly in the past few years. The main operations are still heat treating, forging, punching, machining and assembling.

Standardization — Many producers purposely standardize their products in order to concentrate on meeting the increased demand rather than changing design or making new tools, which would take time and added equipment. That does not mean that the industry is standing still, however.

The metalworking world, especially electronic and aircraft industries, is constantly demanding more specialization, and tool manufacturers must modify their products or make new ones to meet this demand. In addition, the modern worker is more quality conscious in regard to his tools. The manufacturers must meet that quality or stand to lose some business.

But the first half of 1953 should see a brisk business in small tools. What happens after that depends on the general business climate.

Small Hand Tools

Average Monthly Shipments

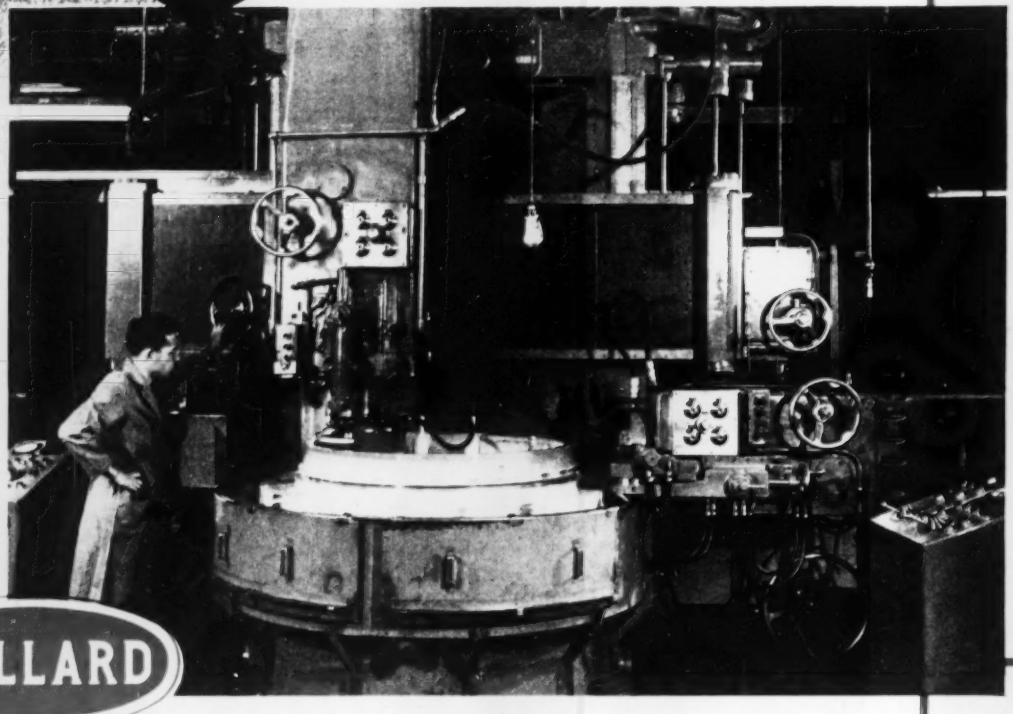
1941	$3,750,000
1944	7,500,000
1946	7,600,000
1947	7,800,000
1948	6,619,000
1949	5,368,000
1950	6,461,000
1951	8,674,000
1952	8,439,000

Source: Service Tools Institute

Manganese Program Expands

Under an amendment of its Defense Materials Procurement Agency's contract, the Southwestern Engineering Co., Los Angeles, will expand its project aimed at developing an economical method of extracting manganese from low-grade domestic ores to include Aroostook manganese ores from Maine and so-called "wad" ores from Virginia and Arkansas.

NOW VERTICAL CHUCKING Grinders BY BULLARD



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Precision, flexibility of control, safety design and productive efficiency place THIS LINE OF VERTICAL CHUCKING GRINDING MACHINES as an IMPORTANT item on your list for immediate investigation.

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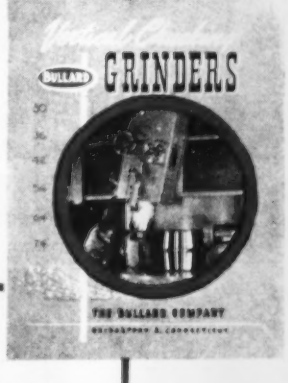

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

Now that nearly all engineering and styling features on 1953 cars have come to light, it's clear no revolution is occurring—with the exception of Studebaker styling

DETROIT

THE BUMPER-BEARING crop of 1953 autos is virtually out. Yet to hit the road are the Studebaker line, the Hudson Jet and the Nash Rambler. Material and labor troubles are to blame in two cases, with die troubles plaguing at least one of the new-bodied trio.

Promotion materials on Studebaker and the Hudson Jet are already on the scene, but last week the Jets numbered only somewhat over a thousand with production running about 20 an hour.

To Come—Yet to be heard from is the Nash Rambler which will be a miniature of the Pinin Farina styling on the other Nash models. Several truckloads of the little rascals have been seen in the Detroit environs, but Nash is saving its promotion wad as scheduled for a big surprise about Mar. 5.

The traditional "unexpectedly enthusiastic consumer response" routine is being recited by the automaker public relations people, but stylists and engineers admit there's not a lot to get unexpectedly enthusiastic about. Automakers will ride the waning demand for one more year with harder selling before they get down to shaking changes to rekindle the consumer urge.

Studebaker, the Exception—Generally conceded to be the strategic move is Studebaker's sports styling. When you stop to consider that the designs had to be frozen two years ago before the sports car vogue was barbershop conversation, Studebaker's anticipation of the trend was remarkable. Whether or not the family with kids and groceries will want one is the question rival stylists are waiting to have answered.

Among the big three, Chevrolet's Bel Air is probably top news, with Plymouth and Dodge styling a close second. Frankly aimed at "invasion of a market", Bel Air offers insurance that this will not be the year for Ford to regain sales leadership. Some feel that Ford decided this was not the year to challenge and will be putting its real offensive into 1954 lines.

Pontiac Problems—The Pontiac has an all-new body, but to the layman the distinguishing feature is the rear fender kick-up. That touch could probably have been added for a few hundred thousand dollars rather than the several million in a complete body rework.

Cadillac comes home full bore at 210 horsepower, winner in the annual horsepower derby. Lincoln is a close second with 205 hp in a somewhat lighter car. Chrysler, several notches back, avers that it is "not in any horsepower race" which many claim it started.

No Revolution—By and large 1953 has been just another year automotivewise. The gradual evolution of accessories becoming standard equipment continues with directional signals being offered by most automakers as standard on everything but their un-deluxe lines. Automatic transmission efficiency continues to increase with sales, and the no-shift accessory is now standard on many of this year's models.

Tinted glass has arrived in 1953. Every automaker offers the no-glare product and here's the dope if you're considering it: Plain glass reduces spectrum intensity to about 82-88 percent when it's clean. A little dirt will drop the figure lower in a hurry. Tinted glass cuts the spectrum intensity to about 72-76 per cent when it's clean. A figure of 70 per cent intensity is considered safe so the basic question seems to be a matter of taste. Some users report the commodity is particularly useful at night. Others prefer sun glasses which can be removed.

Facts on All—On the following page is a list of four-door sedan models for 1953. Prices are f.o.b. factory. Major equipment items are included so you can get an idea of what your dollar will buy, and a moment's computation will show you the list price is a far cry from the fully dressed vehicle. Then you'll have taxes.

Not included is air conditioning first perfected in 1937 and now available at $594 on Oldsmobile, heavy Buicks, Cadillacs ($619) and later this year on Chryslers (price unannounced). Nash reclining seats at $18.45 and Studebaker's hill-holder at $15.08 are other special accessories omitted as are power brakes and electric window lifts. Only the Chrysler Custom Imperial offers both as standard equipment, but they are available for some models of Buick, Cadillac, DeSoto, Mercury, Lincoln, and Packard. Additional cost for power brakes ranges from $35.19 (Buick) to $40 (Lincoln). Lincoln is also high with electric window lifts at $165; DeSoto offers them at $115.00, Cadillac at $138.64, and Packard at $153.

Think the old buggy'll run another year?

Auto, Truck Output

U. S. and Canada

	1953	1952
January	613,517*	409,406
February		467,691
March		517,207
April		576,505
May		546,673
June		560,947
July		246,461
August		293,722
September		592,253
October		645,862
November		556,366
December		*569,456
Total		*5,981,626

Week Ended	1953	1952
Jan. 17	148,718	98,669
Jan. 24	149,578	94,722
Jan. 31	150,289	102,402
Feb. 7	146,809	102,406
Feb. 14	148,911	111,821
Feb. 21	149,500*	110,542

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

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1953 4-DOOR SEDANS—What You Get For Your Money

MAKE	Specifications							Cost of Accessories					
	Price	Wheel-base	Approx wt.	Max. hp at rpm	Piston Displ. (cu. in.)	Compr. Ratio	Engine Type	Over-drive	Auto. Trans.	Power Steer.	Tinted Glass	Radio	Heater
CHEVROLET													
"150" series	$1670	115	3215	108/3600	235.5	7.1-1	OHV-S6			$177.55	$30.49	$87.70	$86.15
"210" series	1761	115	3250	108/3600*	235.5	7.1-1†	OHV-S6		$178.35	177.55	30.49	87.70	86.15
Bel Air	1874	115	3275	108/3600*	235.5	7.1-1†	OHV-S6		178.35	177.55	30.49	87.70	86.15
PONTIAC													
Chieftain "6"	2014	122		115/3800‡	239.2	7.0-1§	L-S6		178.35	177.40	32.21	79.91	80.82
Dlx Chieftain "6"	2118	122		115/3800‡	239.2	7.0-1§	L-S6		178.35	177.40	32.21	79.91	80.82
Chieftain "8"	2089	122		118/3600**	268.4	6.8-1§	L-S8		178.35	177.40	32.21	79.91	80.82
Dlx Chieftain "8"	2193	122		118/3600**	268.4	6.8-1§	L-S8		178.35	177.40	32.21	79.91	80.82
OLDSMOBILE													
"88" series	2327	120	3667	150/3600	303.7	8.0-1	OHV-V8		178.35	177.40	32.30	100.82	78.58
Super "88" series	2461	120	3704	165/3600	303.7	8.0-1	OHV-V8		178.35	177.40	32.30	100.82	78.58
Classic "98" series	2785	124	3815	165/3600	303.7	8.0-1	OHV-V8		178.35	177.40	32.30	100.82	78.58
BUICK													
Special 40	2020	121.5	3710	125/3800	263.3	7.0-1	OHV-S8		192.50	177.40	32.30	91.72	67.26
Special 40 Dlx	2064	121.5	3710	125/3800	263.3	7.0-1	OHV-S8		192.50	177.40	32.30	91.72	67.26
Super 50 Riviera	2466	125.5	3905	164/4000	322	8.0-1	OHV-V8		192.50	177.40	32.30	91.72	67.26
Roadmaster 70 Riviera	2971	125.5	4100	188/4000	322	8.5-1	OHV-V8		192.50	standard	32.30	91.72	67.26
CADILLAC													
"62" sedan	3666	126	4213	210/4150	331	8.25-1	OHV-V8		standard	176.98	45.52	131.92	119.00
"60" sedan	4304	130	4350	210/4150	331	8.21-1	OHV-V8		standard	176.98	45.52	131.92	119.00
PLYMOUTH													
Cambridge	1685	114		100/3600	217.8	7.1-1	L-S6	97.55	135.00		21.50	82.50	56.25
Cranbrook	1772	114		100/3600	217.8	7.1-1	L-S6	97.55	135.00		21.50	82.50	56.25
DODGE													
Meadowbrook Spl	2088	119	3205	103/3600	230.2	7.0-1	L-S6	97.55			21.30	82.50	78.25
Meadowbrook	2181	114	3195	103/3600	230.2	7.0-1	L-S6	97.55			21.30	82.50	78.25
Coronet	2365	114	3280	140/4400	241.3	7.1-1	OHV-V8	97.55			21.30	82.50	78.25
DE SOTO													
Powermaster	2455	125	3555	116/3600	250.6	7.0-1	L-S6	97.55	130.10	198.90	21.50	101.00	78.25
Fire Dome	2739	125	3705	160/4400	276.1	7.1-1	OHV-V8	97.55	236.50	198.90	21.50	101.00	78.25
CHRYSLER													
Windsor	2392	125	3760	119/3600	264.5	7.0-1	L-S6		130.10	198.90	20.00	101.00	78.25
Windsor Dlx	2605	125	3770	119/3600	264.5	7.0-1	L-S6		standard	198.90	20.00	101.00	78.25
New Yorker	3124	125	4000	180/4000	331.1	7.5-1	OHV-V8		standard	198.90	20.00	101.00	78.25
Custom Imperial	3925	133	4425	180/4000	331.1	7.5-1	OHV-V8		standard	198.90	20.00	101.00	78.25
FORD													
Mainline 6	1541	115		101/3500	215.3	7.0-1	OHV-S6	109.70	184.00		23.13	87.50	43.85
Customline 6	1627	115		101/3500	215.3	7.0-1	OHV-S6	109.70	184.00		23.13	87.50	43.85
Mainline 8	1612	115		110/3800	239.4	7.2-1	L-V8	109.70	184.00		23.13	87.50	43.85
Customline 8	1698	115		110/3800	239.4	7.2-1	L-V8	109.70	184.00		23.13	87.50	43.85
MERCURY													
Custom	2057	118		125/3800	255.4	7.2-1	L-V8	113	195		21.43	109.00	74.00
Monterey Spl. Cust.	2133	118		125/3800	255.4	7.2-1	L-V8	113	195		21.43	109.00	74.00
LINCOLN													
Cosmopolitan	3226	123		205/4200	317.5	8.0-1	OHV-V8		standard	185.00	27.50	135.00	124.00
Capri	3453	123		205/4200	317.5	8.0-1	OHV-V8		standard	185.00	27.50	135.00	124.00
HUDSON													
Jet	1685	105	2800	104/4000		7.5-1	L-S6						
Super Jet	1775	105	2800	104/4000		7.5-1	L-S6						
Wasp Dlx	2106	119.8	3380	112/4000	232	6.7-1	L-S6	110.77	175.71		41.83	99.82	74.39
Wasp Super	2251	119.8	3480	127/4000	262	6.7-1	L-S6	110.77	175.71		41.83	99.82	74.39
Hornet	2529	123.8	3570	145/3800	308	7.2-1	L-S6	110.77	175.71		41.83	99.82	74.39
KAISER													
Dlx	2316	118.5	3210	118/3650	226.2	7.3-1	L-S6	98.79	165.00		15.00	83.50	51.50
Manhattan	2443	118.5	3275	118/3650	226.2	7.3-1	L-S6	98.79	165.00		15.00	83.50	51.50
Corsair (Henry J 2-Dr.)	1379	100	2405	68/4000	134.2	7.0-1	L-S4	98.79			15.00		40.00
NASH													
Statesman	2178	114	3045	100/3800	195.5	7.4-1	L-S6	103.50	178.85		16.10	89.60	66.75
Statesman Custom	2331	114	3045	100/3800	195.5	7.4-1	L-S6	103.50	178.85		16.10	89.60	66.75
Ambassador	2557	121	3480	120/3700	252.5	7.3-1	OHV-S6	112.25	178.85		16.10	89.60	66.75
Ambassador Custom	2716	121	3480	120/3700	252.5	7.3-1	OHV-S6	112.25	178.85		16.10	89.60	66.75
PACKARD													
Clipper	2588	122	3725	150/4000	288	7.7-1	L-S8	110.00	199.00	195.00	45.20	97.00	79.50
Clipper Dlx	2735	122	3745	160/3600	327	8.0-1	L-S8	110.00	199.00	195.00	45.20	97.00	79.50
Cavalier	3234	127	3960	180/4000	327	8.0-1	L-S8	110.00	199.00	195.00	45.20	97.00	79.50
Patrician	3735	127	4190	180/4000	327	8.0-1	L-S8		standard	195.00	45.20	97.00	79.50
STUDEBAKER													
Champion Custom	1615	116.5		85/4000	169.6	7.0-1	L-S6	104.99	231.24		23.87		
Champion Dlx	1705	116.5		85/4000	169.6	7.0-1	L-S6	104.99	231.24		23.87		
Champion Regal	1785	116.5		85/4000	169.6	7.0-1	L-S6	104.99	231.24		23.87		
Commander Dlx	1940	120.5		120/4000	232.6	7.0-1	OHV-V8	117.97	243.08	161.25	24.07		
Commander Regal	2020	120.5		120/4000	232.6	7.0-1	OHV-V8	117.97	243.08	161.25	24.07		
WILLYS													
Aero Lark	1579	108	2511	75/4000	161	6.9-1	L-S6	80.00			19.40	74.25	62.81
Aero Falcon	1699	108	2511	75/4000	161	6.9-1	L-S6	80.00			19.40	74.25	62.81
Aero Ace	1869	108	2588	90/4200	161	7.6-1	F-S6	80.00			19.40	74.25	62.81

* With Powerglide, 115/3600; † with Powerglide, 7.5-1; ‡ with Hydramatic, 118/3800; § with Hydramatic, 7.7-1; ** with Hydramatic, 122/3600.

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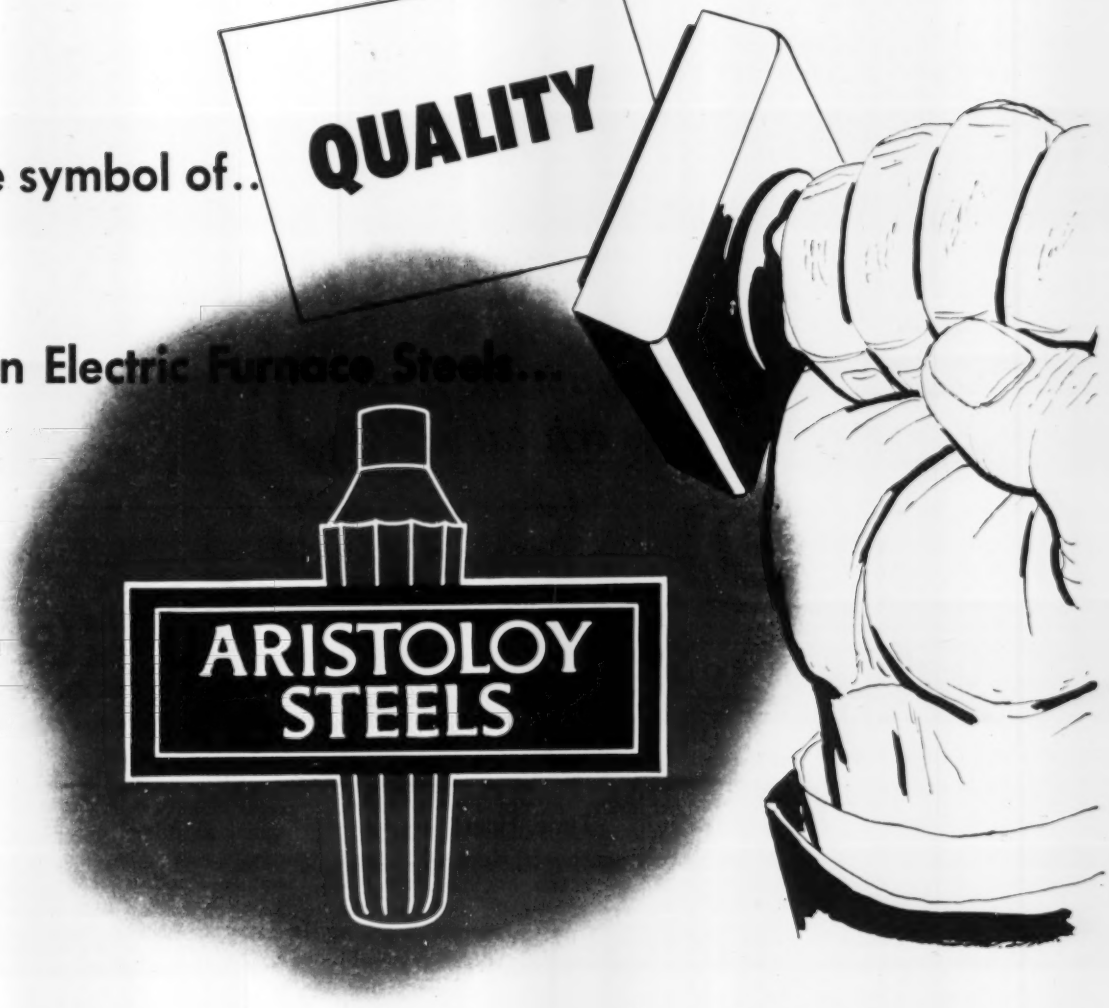

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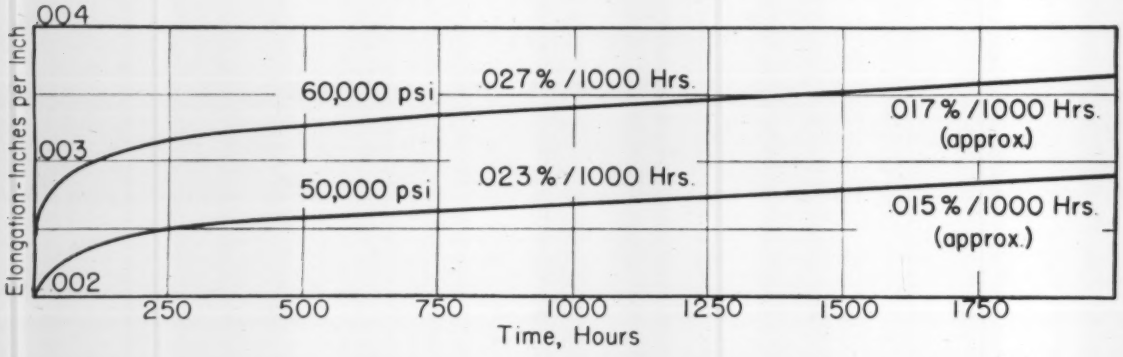
"17-22-A"(S) gives maximum creep resistance up to 1000°F! Saves critical alloys!



Time-elongation creep curves at 900°F. show high creep resistance of "17-22-A" (S)

TO get high alloy performance at low cost in gas turbine parts that operate at temperatures not exceeding 1000°F., use low alloy Timken® "17-22-A"(S).

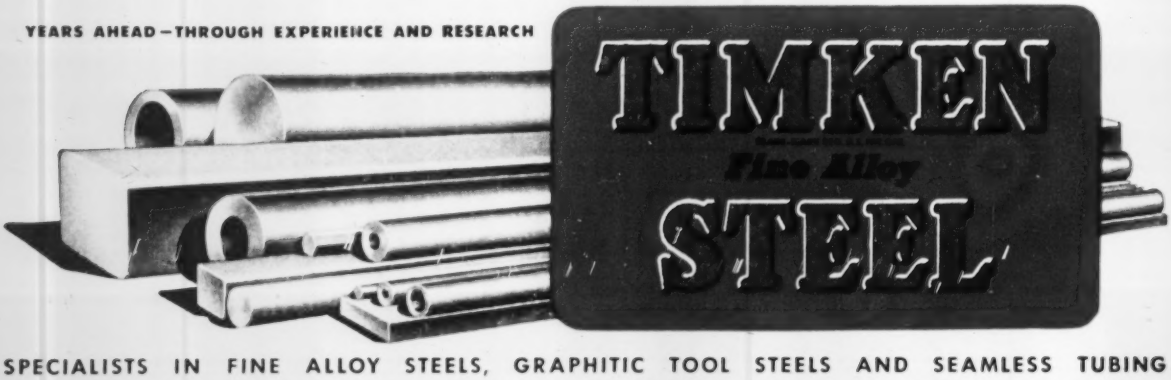
You save strategic alloys because "17-22-A"(S) contains less than 3% alloys.

Yet you get a steel that's been used successfully for 10 years in refinery and steam power applications where resistance to creep at high temperatures is essential. The graph above shows how "17-22-A"(S) retains its creep resistance under prolonged high temperature and stress.

In addition, "17-22-A"(S) resists heat checking and thermal cracking. It's easy to machine and weld. It's readily workable up to 2300°F. Maximum high temperature properties can be developed by simple air cooling heat treatment, holding possible distortion to a minimum.

For complete information about "17-22-A"(S) and its companion analysis, "17-22-A", write for Technical Bulletin, Number 36. And for help with your high temperature problem, call upon our Technical Staff. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



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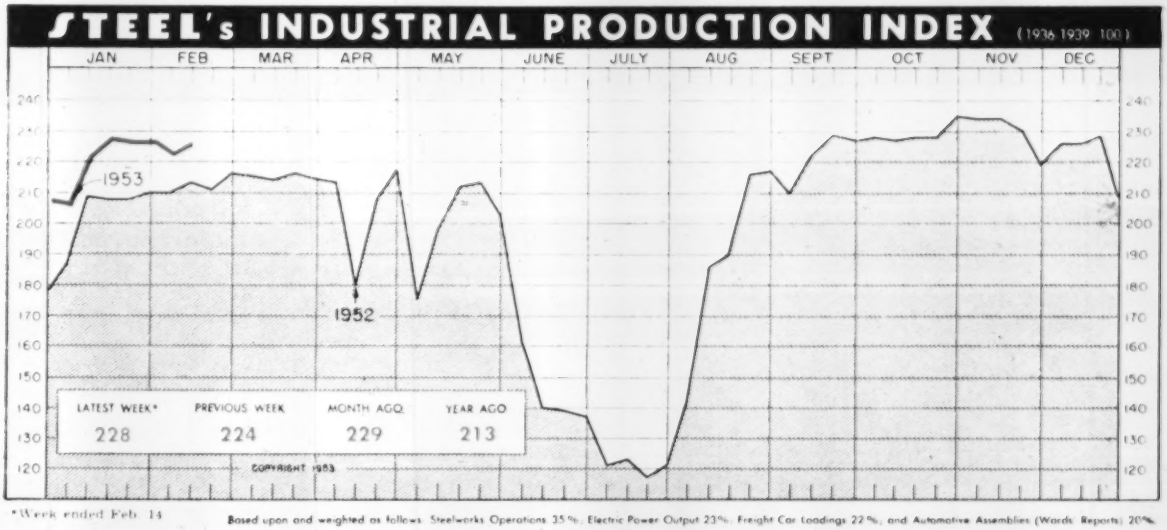


*Week ended Feb. 14

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards Reports) 20%.

Metalworking companies can expect an orderly decontrol of materials through open-ending of the Controlled Materials Plan. Index inches up to former high level

BUSINESS ACTIVITY, now at peak momentum, may show more signs of genuine health as industry goes off its austere diet of raw materials. The nation's industries, unlike most human patients, are often their own best doctors.

A significant step toward a more wholesome economy may be the open-ending of the Controlled Materials Plan by the Office of Defense Mobilization. Any steel, copper and aluminum left after CMP allotments have been met may be sold to anyone. Previously, CMP allotment tickets were needed to obtain any amounts of these raw materials.

Orderly Withdrawal—But open-ending of CMP doesn't necessarily mean that the government will toss material controls out the window immediately. Decontrol probably will occur in an orderly manner. Tickets already issued for second quarter must be honored before materials are sold on a first-come, first-served basis. Among the steel products which may continue in short supply are: Large bars, heavy and wide plates, and hot-rolled and cold-rolled sheets.

Real significance of the open-ending is that many manufacturers in the second half of 1953 will have to ferret out their own materials. Nevertheless, open-ending is a move toward making private industry the master of its own destiny once again.

Index Inches Up—Production is continuing at the high levels attained in mid-January. STEEL's industrial activity index in the week ended Feb. 14, after a slight decline a week earlier, edged up 4 points to the level attained two weeks earlier—228 per cent of the 1936-1939 average. Steel production rose 2 points to 99.5 per cent of capacity, while automotive output increased slightly more than 1000 units. Freight car loadings and electricity production in the week ended Feb. 14 remained virtually the same as a week earlier.

Corporate Dividends Vary . . .

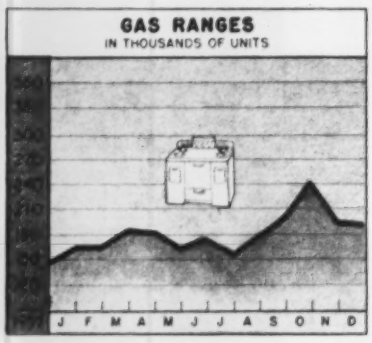
While dividends paid in January by all manufacturers remained about the same as a year earlier, payments in the various metalworking industries were at sharp variance.

The Commerce department's Office of Business Economics reports that cash dividend payments by manufacturing corporations issuing public reports totaled $170.5 million in January, compared with $169.6 million in January, 1952. The iron and steel industry however paid $9.9 million or 14 per cent less than a year earlier. Producers of nonferrous metals paid $5.2 million, up 23 per cent from January, 1952. Nonelectrical machinery makers paid $27.1 million, down 4 per cent. Electrical machinery makers paid $25.8 million, virtually the same as a year earlier. The automotive industry lowered dividends 4 per cent to $2.5 million. The transportation industry (including aircraft) raised their dividend payments in January 32 per cent to $3.3 million.

Auto Output Blocked . . .

Scattered labor disputes are blocking the automotive industry's drive to surpass the high-point in 1952 production. Several weeks ago, manufacturers were a hair's breadth away from attaining this goal for U. S. passenger cars and trucks. In the final week of January, auto-truck production reached 141,317 assemblies, only 5337 units under the 1952 record set at the end of October, says *Ward's Automotive Reports*.

Weekly operations in February

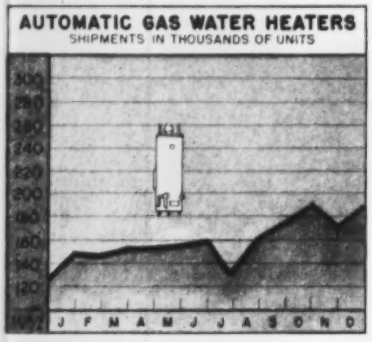


Gas Ranges

Shipments in Units

	1952	1951	1950
Jan	166,100	260,600	165,000
Feb	166,200	254,000	209,000
Mar	185,200	289,800	264,000
Apr	182,300	225,000	239,100
May	162,800	177,800	242,800
June	175,700	128,500	217,000
July	154,200	116,400	254,800
Aug	178,600	168,100	331,500
Sept	199,600	183,600	287,000
Oct	239,700	250,900	305,000
Nov	192,800	192,200	269,100
Dec	150,600	145,000	232,700
Total	2,193,800	2,356,400	3,023,200

Gas Appliance Mfrs. Assn.

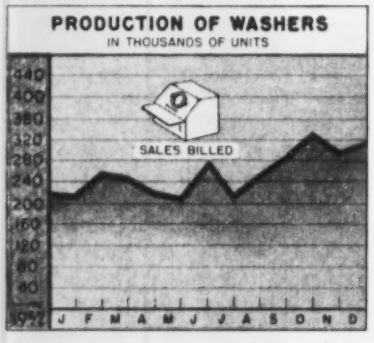


Automatic Gas Water Heaters

Shipments in Units

	1952	1951	1950
Jan	148,700	225,600	131,600
Feb	145,800	213,400	156,500
Mar	153,300	223,300	172,800
Apr	153,300	199,400	176,400
May	155,300	167,400	195,200
June	159,000	131,500	207,100
July	131,300	102,800	197,500
Aug	161,500	124,400	259,800
Sept	171,200	130,900	222,600
Oct	185,300	148,800	235,100
Nov	169,100	143,400	206,000
Dec	188,100	127,200	202,500
Total	1,922,200	1,937,700	2,363,100

Gas Appliance Mfrs. Assn.

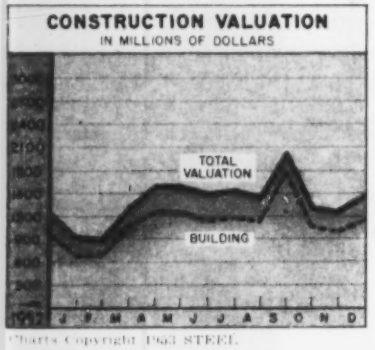


Household Washers

Sales Billed Units

	1952	1951	1950
Jan	213,998	321,092	275,576
Feb	255,864	311,328	342,967
Mar	248,431	368,455	423,802
Apr	217,211	292,193	333,072
May	213,668	253,942	304,640
June	274,457	254,119	325,217
July	207,393	139,799	282,261
Aug	254,537	239,081	381,452
Sept	283,732	313,756	424,013
Oct	327,814	297,210	439,924
Nov	293,079	262,484	379,964
Dec	310,661	218,664	377,013
Totals	3,101,045	3,301,123	4,289,931

American Home Laundry Mfrs. Assn.



Construction Valuation

(37 States) in Millions of Dollars

	Total		Building	
	1952	1951	1952	1951
Jan	902.1	1,043.2	695.4	881.9
Feb	885.2	1,140.5	697.8	962.1
Mar	1,321.3	1,267.4	1,056.0	1,043.8
Apr	1,597.5	1,375.0	1,243.9	1,108.9
May	1,563.6	2,553.0	1,216.2	2,265.0
June	1,488.8	1,108.9	1,133.3	1,098.1
July	1,511.3	1,379.8	1,170.8	1,084.7
Aug	1,438.7	1,262.8	1,147.5	1,043.5
Sept	2,039.2	1,082.9	1,790.8	884.2
Oct	1,310.1	1,061.1	1,072.8	914.1
Nov	1,218.8	931.8	989.9	771.6
Dec	1,467.1	1,234.3	1,147.7	939.1
Total	16,774.9	15,751.6	13,362.1	13,027.9

F. W. Dodge Corp.

Charts Copyright 1953 STEEL.

Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Jan. 18	Gray Iron Castings	Jan. 12	Radio, TV	Feb. 2
Employ. Metalwkg.	Jan. 18	Indus. Production	Feb. 16	Ranges, Elec.	Feb. 2
Employ., Steel	Dec. 15	Ironers	Feb. 9	Refrigerators	Feb. 2
Fab. Struc. Steel	Feb. 9	Machine Tools	Feb. 9	Steel Castings	Jan. 12
Foundry Equip.	Feb. 16	Malleable Castings	Jan. 12	Steel Forgings	Jan. 12
Freight Cars	Feb. 16	Prices, Consumer	Jan. 26	Steel Shipments	Nov. 3
Furnaces, Indus.	Feb. 2	Prices, Wholesale	Jan. 26	Vacuum Cleaners	Feb. 9
Gear Sales	Jan. 26	Pumps	Feb. 16	Wages, Metalwkg.	Jan. 26

however, are declining under the level attained in the week ended Jan. 31. Total U. S. production of passenger cars and trucks in the first week in February numbered 137,732 units. This output was raised in the week ended Feb. 14 to 138,793 units, still a long way from the 146,654 weekly record for 1952.

Suppliers' strikes are the main reason for the downslide, although change-over problems trimmed output a bit. Only General Motors Corp. was left unscarred by a rash of production deterrents. Yet the cloud cast over production may lift as suddenly as it appeared.

Combined U. S. and Canadian auto-truck output in the week ended Feb. 14 totaled 148,911 units, up 2103 units from the previous week. In the comparable week of 1952, U. S. and Canadian manufacturers drove only 111,821 passenger cars and trucks off their assembly lines.

Freight Car Orders Drop . . .

Production of freight cars is continuing to make steady upward progress and is far outpacing the rate of incoming orders. The Association of American Railroads and the American Railway Car Institute announced that production of new domestic freight cars in January totaled 7981 units, the highest monthly output since before the steel strike. Cars ordered in January dropped to 5536 units, trimming the backlog to 77,414 freight cars. A year earlier, the industry backlog amounted to 120,251 cars.

Business Profits Lag . . .

Profits are dropping off, despite the rise in production. That's the consensus of industrial buyers surveyed by the Purchasing Agents of Chicago. Since October, more purchasing agents have reported profit declines than have reported increases. Step-ups in production, on the other hand, have been the rule since the end of the steel strike, according to the association's January survey.

Inventories continued to increase during January, but the uptrend was gradual. Many buyers say they need larger inventories to

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	99.5	97.5	100.0
Electric Power Distributed (million kwhr)	8,147	8,129	7,440
Bituminous Coal Output (daily av.—1000 tons)	1,423	1,476	1,764
Petroleum Production (daily av.—1000 bbl)	6,530[1]	6,522	6,356
Construction Volume (ENR—millions)	$267.8	$288.5	$233.5
Automobile, Truck Output (Ward's—units)	148,911	146,809	111,821
TRADE			
Freight Car Loadings (unit—1000 cars)	685	691	738
Business Failures (Dun & Bradstreet, number)	200	159	125
Currency in Circulation (millions)[3]	$29,776	$29,657	$28,425
Dept. Store Sales (changes from year ago)[3]	+1%	+2%	-6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,498	$18,064	$13,056
Federal Gross Debt (billions)	$267.4	$267.4	$260.1
Bond Volume, NYSE (millions)	$11.4	$17.8	$10.5
Stocks Sales, NYSE (thousands of shares)	$5,718	$8,893	$5,370
Loans and Investments (billions)[4]	$77.0	$77.3	$73.8
United States Gov't. Obligations Held (billions)[4]	$31.4	$31.7	$32.4
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	210.7	210.7	243.6
All Commodities[7]	109.5	109.2	113.0
All Commodities Other Than Farm and Foods[7]	112.8	112.8	114.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1952, 2,077,040; 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

meet the demands of their greater production turnovers.

Unfilled orders, after taking a seasonal drop in January, bounced back to the levels attained in November. Deliveries started to speed up, reversing the downtrend in the second half of 1952. Prices in January moved upward, as only a few buyers were able to break down through the price level established last August.

In answer to a special question on the Controlled Materials Plan, 52 per cent of the buyers said they believed that CMP has helped to control inventories, while 48 per cent said "no".

Expenditures on new construction are expected to jump for manufacturers in the Chicago area. Total estimates of the surveyed buyers place new construction outlays at $31 million, compared with $24 million in 1952 and $19 million spent on new plants in 1951.

Aluminum Shipments Rise . . .

Output of aluminum products is soaring in response to the needs of the aircraft industry. On the other hand the production of magnesium products continues on the downgrade.

The Bureau of the Census says that shipments of aluminum products in December reached 179 million pounds, or 33 per cent above December, 1951. Cumulative shipments of 1924 million pounds during 1952 were 10 per cent over the 1951 total. Magnesium wrought products shipped in December totaled 1.4 million pounds, nearly 6 per cent under shipments a year earlier. In 1952, shipments totaled 18.4 million pounds, a 3 per cent decline from 1951.

Construction Awards High . . .

Construction awards in January continued to decline seasonally but were still far above January, 1952. Construction contract awards in the 37 states east of the Rockies in January totaled $1076 million, 27 per cent under the previous month but 19 per cent more than in January, 1952, says F. W. Dodge Corp.

Trends Fore and Aft . . .

Dollar volume of department store sales in 1953 by Feb. 14 was 1 per cent over the same period in 1952. . . Factory shipments of farm pumps rose 8 per cent in dollar volume during 1952. . . Bank clearings in January were around 1 per cent over the same month in 1952. . . Electricity production in the central industrial region of the U. S. is nearly 10 per cent over a year ago.

MAINTAIN PEAK OUTPUT with Pheoll precision-made screws, bolts and nuts—they will speed your assembly work and improve product appearance.

INSURE PRODUCT PERFORMANCE with Pheoll quality screws, bolts and nuts—standardize on these dependable industrial fasteners.

HUGE MANUFACTURING FACILITIES assure rapid production of both standard and special fasteners.

SINGLE SOURCE OF SUPPLY for screws, bolts and nuts in different sizes, types and metals.

OVERNIGHT DELIVERY to principal cities from centrally-located Pheoll factory and warehouses.

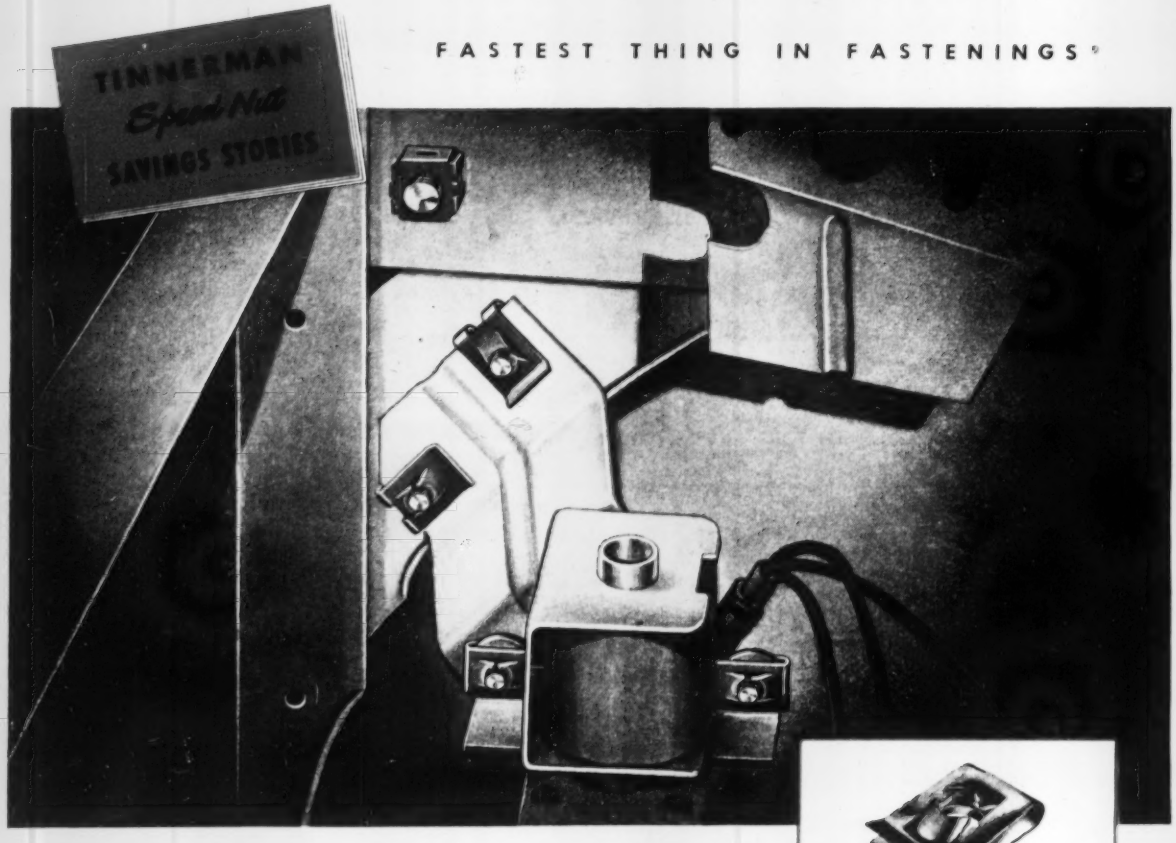
FACTS ABOUT Pheoll YOU SHOULD KNOW

- One of the nation's leading producers of industrial fasteners.
- Pheoll products are widely used in part assembly when quality is of prime importance.
- Men who produce Pheoll industrial fasteners are highly trained and experienced craftsmen.
- All products are manufactured under rigid quality control standards.
- Constant product inspection from laboratory metal analysis, through production and final finish is your assurance of precision made, trouble-free screws, bolts and nuts.

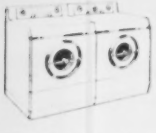
Write for this free Bulletin

PHEOLL SCREWS BOLTS

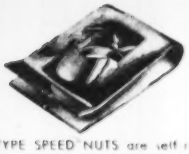
FASTEST THING IN FASTENINGS®



BENDIX Perfect Laundry Pair "Cleans Up" with SPEED NUT Savings!



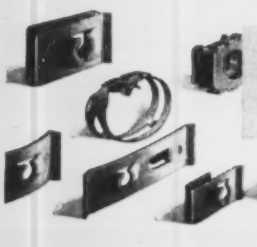
For years, Bendix engineers have relied on SPEED NUTS to cut assembly costs and step up production schedules. That is why SPEED NUT brand fasteners were specified on the new "Perfect Pair" automatic washer and dryer units. Here is a direct quotation from a recent Bendix report . . . ". . . because we design from the ground up with Tinnerman, we effect basic economies. These include lower production costs and greater efficiency that result in lower retail prices and reduced service costs for consumers. Thus, in our production, we consider Tinnerman products more basic than nuts and bolts." Chances are your Tinnerman representative can turn your assembly problems into production savings. See him soon for details on the Fastening Analysis Service available for your products!



U-TYPE SPEED NUTS are self-retaining, snap in place over panel edges or center panel locations, remain in bolt-receiving position for fast, easy assembly.

SPEED GRIP Nut Retainers snap in place by hand . . . no welding, clinching or staking. They reduce materials handling and are ideal for blind locations.

A copy of "SPEED NUT Savings Stories", an interesting booklet of typical Tinnerman savings to industry, is yours on request. Write: TINNERMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S.A., 7 rue Henri Barbusse, Levallois (Seine).



TINNERMAN *Speed Nuts*

MORE THAN 8000 SHAPES AND SIZES

Men of Industry

ROBERT W. JEFFERY
. . . gen. sales mgr. of Currier Co.

GILFRY WARD
. . . heads American Manganese Steel Div.

WILLIAM C. WILSON
. . . Mesta Machine sales manager

Robert W. Jeffery was appointed general sales manager, **Currier Co.**, Oakland, Calif. He was formerly manager of infra-red sales for Fostoria Pressed Steel Corp.

E. J. Dalton was elected president of **Yates-American Machine Co.**, Beloit, Wis., to succeed **W. D. Johnson**, resigned. Mr. Dalton continues as chairman of the board and chief executive officer. **A. H. Woeckel**, executive vice president, will be in charge of operations of Beloit plants.

John R. Cary was elected president, **Browning Crane & Shovel Co.**, Cleveland, to succeed his father, **Sheldon Cary**, who held that position for 40 years and who is now chairman of the board. Other officers elected are **D. H. Leuszler**, vice president; **C. F. Barry**, treasurer, and **J. F. Svoboda**, secretary. **Arthur S. Meyer**, executive vice president, and **George T. Stalley**, assistant secretary and assistant treasurer, retired. In addition to the chairman and president, directors of the company are **David J. Hopkins, Wallace H. Maerkle, Sheldon Reynolds, C. F. Barry** and **Russell Olderman**.

Harry E. McDonnell retired Feb. 1 as superintendent, coke plant and blast furnaces, at **Weirton Steel Co.**, Weirton, W. Va.

Gilfry Ward was elected president and **Joseph L. Mullin** first vice president of **American Manganese Steel Division**, American Brake Shoe Co., New York. Mr. Ward joined the Amsco division in 1928. In 1938 he became vice president and in 1948 was placed in charge of sales. Mr. Mullin was formerly vice president in charge of operations for the division.

Rollin M. Russell was appointed executive engineer for the West Coast operations of **Continental Aviation & Engineering Corp.**, subsidiary of Continental Motors Corp., Muskegon, Mich.

L. G. Knight, since 1945 district manager of purchases and traffic, also assistant treasurer of **Bethlehem Pacific Coast Steel Corp.**, was appointed assistant to **H. H. Fuller**, president. Mr. Knight's headquarters will remain in Seattle, where he has been associated with steel production for 43 years. His assistants, **Howard J. Lenihan** and **Herbert F. Price**, assume charge of their respective departments, traffic and purchasing.

Chester E. Grigsby replaces **Ralph D. Brizzolara**, resigned, on the board of **General Steel Castings Corp.**, Granite City, Ill. Mr. Grigsby is vice president of American Steel Foundries.

William C. Wilson was appointed sales manager, **Mesta Machine Co.**, Pittsburgh. He has been with Mesta for the last 18 years.

Nelson C. George was appointed assistant chief metallurgist of the Gary, Ind., sheet and tin mill, **United States Steel Corp.** He has been associated with this plant since 1936, and since 1947 has been development metallurgist.

Harold E. Kleintop was appointed manager of wire product operations of **Hewitt-Robins Inc.**, responsible for production and sales at the Philadelphia plant which was acquired about a year ago from Korb-Pettit Wire Fabrics & Iron Works Inc. Mr. Kleintop was vice president and chief engineer of the plant when it was sold to Hewitt-Robins.

S. S. Goodwin, manager of mines, **New Jersey Zinc Co.**, was named a vice president with headquarters in New York. He will continue to be manager of mines.

Norman C. Halleck was appointed to the newly created post of transportation manager, Chicago district, **U. S. Steel Corp.**, with headquarters in Kirk Yard, Gary, Ind. He is succeeded by **Charles Iams Jr.** as assistant general superintendent, Gary, Ind., Works, in

charge of cost control. Mr. Iams formerly was assistant to the general superintendent, Gary sheet and tin mill.

Robert Smith was appointed assistant vice president-sales, eastern area, for **Pittsburgh Screw & Bolt Corp.**, with headquarters in New York. **Samuel M. Sipe** was made manager of sales in the New York district succeeding Mr. Smith.

Robert E. Eirons was appointed plant metallurgist for the Massillon, O., plant of **Union Drawn Steel Division**, Republic Steel Corp. A member of the division for seven years, he has been a stainless steel metallurgist.

Fred L. Pritchard was appointed representative of the Cincinnati office of **Brown & Sharpe Mfg. Co.**, effective Apr. 1 when **Howard K. Jackson** will retire after 34 years' service with the company.

Claud S. Gordon Co., Chicago, appointed **Claud A. Gates** as its representative in New York city, northern New Jersey, Long Island, Westchester county, N. Y., and western Connecticut areas. He previously was vice president of Wheelco Instruments Co.

Scovill Mfg. Co., Waterbury, Conn., named **Edward F. Anderson** assistant to the vice president in charge of manufactured sales with headquarters in Waterbury. He formerly was in the New York office. Also named were **Hayden R. Hotchkiss**, New York, and **W. E. Ashwell**, Chicago, as regional sales managers for the company's line of Gripper zippers.

Russell Mfg. Co., Middletown, Conn., elected **Leo S. Sullivan** vice president in charge of the automotive and aero sales division, **Peter F. Madsen** vice president in charge of the belting sales division, **Bruce S. Williams** vice president in charge of material and production control, and **A. Paul Smith Jr.** secretary.

E. Allan Williford was promoted from vice president and general manager, **Link Aviation Inc.**, Binghamton, N. Y., to president of the firm. He succeeds **Edwin A. Link**, founder and board chairman. Mr. Link also becomes director of research and engineering.

WILLIAM G. FIENEMANN
Worcester Pressed Steel sales post

JOHN E. KING
Worcester Pressed Steel sales post

Worcester Pressed Steel Co., Worcester, Mass., appointed **William G. Fienemann** assistant sales manager and **John E. King** assistant to the sales manager. Mr. Fienemann continues duties as product development manager. Mr. King is responsible for cold-rolled strip steel and cold-finished bar sales.

Turchan Follower Machine Co., Detroit, appointed **Gale S. Humes** general manager, **Otto C. Turchan** sales manager, and **Demeter Kiurski** chief engineer.

James W. Tweedy Jr., new executive vice president and general manager, **Redmond Co. Inc.**, Owosso, Mich., was placed in charge of all company operations. He advances from vice president in charge of induction motor sales.

Frank W. Jones was appointed general sales manager of **Bradford Machine Tool Co.**, Cincinnati. He will be in charge of both the machine tool and electric tool divisions. He has had many years of experience in the sales and service departments of Cincinnati Bickford Tool Co.

Harold E. Lee was appointed New York district sales manager of **Bridgeport Brass Co.**, Bridgeport, Conn., to succeed the late **A. G. Mohrman**.

Earl F. Oyster rejoined **SPO Inc.**, Cleveland, in the capacity of staff engineer. Mr. Oyster was one of the founders of the company in 1935. He began his career in the foundry industry over 40 years ago as a molding machine designer.

Edward E. Nagel retired as manager of the percussion division of **Chicago Pneumatic Tool Co.**, Utica, N. Y. **Alvin F. Roepnack** was appointed to the newly created position of manager of the entire Utica plant.

Harbison-Walker Refractories Co. appointed **Max W. Demler** as salesman in its Minneapolis sales office. He previously worked in various posts in the engineering, mining and technical sales departments at the home offices in Pittsburgh.

William T. Lake was elected controller, **Curtiss-Wright Corp.**, New York. He formerly served Ford Motor Co. as controller in its River Rouge plants.

Samuel A. Wenk was named to supervise nondestructive testing research at **Battelle Memorial Institute**, Columbus, O.

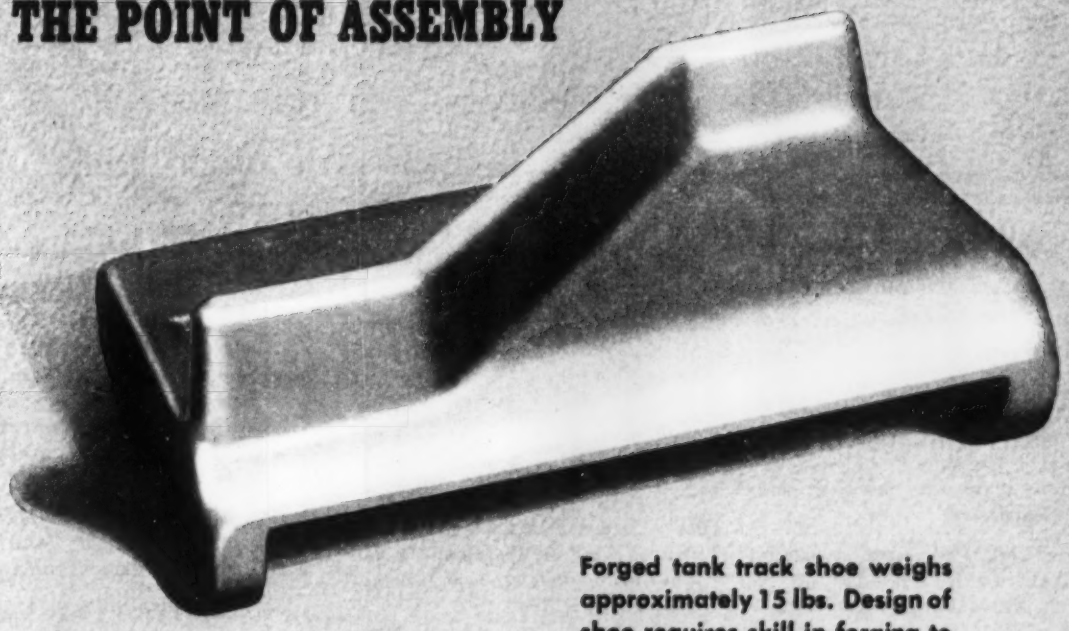
S. S. Moxley was promoted from vice president to executive vice president, **American Cast Iron Pipe Co.**, Birmingham.

John Billera was elected treasurer, **Pressed Steel Car Co. Inc.** His headquarters will be in the company's main offices in Chicago.

Devon W. Fryback was named sales manager of the eastern region for industrial division, **Minneapolis-Honeywell Regulator Co.**, Philadelphia. **O. B. Pyle Jr.** is industrial

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY



Forged tank track shoe weighs approximately 15 lbs. Design of shoe requires skill in forging to provide strength and toughness at the points of stress and shock for dependable performance.

Consult our engineers when you are contemplating conversion to forgings or when you are in need of reliable forging service.

TRANSUE & WILLIAMS

STEEL FORGING CORPORATION · ALLIANCE, OHIO

SALES OFFICES: NEW YORK · PHILADELPHIA · CHICAGO · INDIANAPOLIS · DETROIT · CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

LAWRENCE H. LEMKE
. . . gen. supt., D. J. Murray Mfg.

LAWRENCE H. FLORA
. . . Tinnerman director of engineering

ELDEN L. AUKER
. . . sales mgr. for Bay State Abrasive

manager, mid-Atlantic area, and **Edward J. Klein** of the Philadelphia branch office.

Lawrence H. Lemke was appointed general superintendent, **D. J. Murray Mfg. Co.**, Wausau, Wis. He formerly was superintendent of its machine shop and has been with the company 27 years.

Robert W. Pelz was appointed assistant to the director of research, **Ferro Corp.**, Cleveland.

Tinnerman Products Inc., Cleveland, appointed **Lawrence H. Flora** director of engineering. He joined the engineering staff in 1942 and served as head of the development department until 1949 when he was appointed chief engineer.

New chief engineer of Republic Steel Corp.'s Buffalo district steel plant is **Fred R. Fielding.** He had been Buffalo district assistant chief engineer since 1945.

Elden L. Auker was appointed sales manager for **Bay State Abrasive Products Co.**, Westboro, Mass. He succeeds **E. Halsey Brister** who was named director of product development and quality control, a new post. The changes are effective Mar. 1.

Leonard P. Mellgren was appointed district sales engineer and will head the new district offices in

(*Please turn to Page* 112)

OBITUARIES . . .

Jacob D. Cox, until the first of this year president of **Cleveland Twist Drill Co.**, Cleveland, died Feb. 15. He has been serving as chairman of the board.

Gustavus A. Axelson, 82, retired oil well equipment manufacturer, died Feb. 8 at his home in Los Angeles. He was head of **Axelson Mfg. Co.** until retirement in 1946.

Ralph B. Dimmick, 69, consulting metallurgist for **Armco Steel Corp.**, Middletown, O., died Feb. 12 at Deerfield Beach, Fla. During his career with Armco Mr. Dimmick held many positions in the metallurgical and research departments, and was works metallurgist at the Butler, Pa., plant from 1927 to 1949.

T. Harry Cochrane, 76, pioneer Milwaukee metallurgist, died Feb. 9 at Pompano Beach, Fla. He founded **T. H. Cochrane Laboratories** in Milwaukee about 50 years ago and still operated the inspection division of the firm.

Frank H. Gordon, 71, retired vice president, **Lukens Steel Co.**, Coatesville, Pa., died Feb. 10. He retired in 1948 after having served the concern for 53 years.

Bertram D. Quarrie, 73, former general manager of **Otis Steel Co.**, Cleveland, died Feb. 15. Associated with several firms in Cleveland in the early 1900s, he moved into the steel business with American Steel & Wire Co. as general superintendent, central furnace division. He later joined Otis Steel where he became general manager in 1924. In 1928 he joined Oliver Iron & Steel Corp. and was president until the early '30s.

Herman F. Kelschenbach, 87, former plant superintendent, **Howard Iron Works,** Buffalo, died Feb. 9.

Alfred G. Mohrman, New York district sales manager, **Bridgeport Steel Co.**, Bridgeport, Conn., died Feb. 2.

Melvin H. Kuhl, 52, assistant general manager, industrial division, **Timken Roller Bearing Co.**, Canton, O., died recently.

Henry L. Balderston, 71, a founder and partner in **Precision Thermometer & Instrument Co.**, Philadelphia, died Feb. 10. He retired in 1951.

Irving C. Bolton, 65, vice president in charge of finance, **Warner & Swasey Co.**, Cleveland, died Feb. 11 at Palm Beach, Fla.

John Tod, 82, executive of several concerns, and a director of **Youngstown Sheet & Tube Co.**, Youngstown, for 29 years, died Feb. 14. He was a former executive of **Brier Hill Iron & Steel Co.**

James M. Skinner, 64, retired president and board chairman of **Philco Corp.**, Philadelphia, died Feb. 13.

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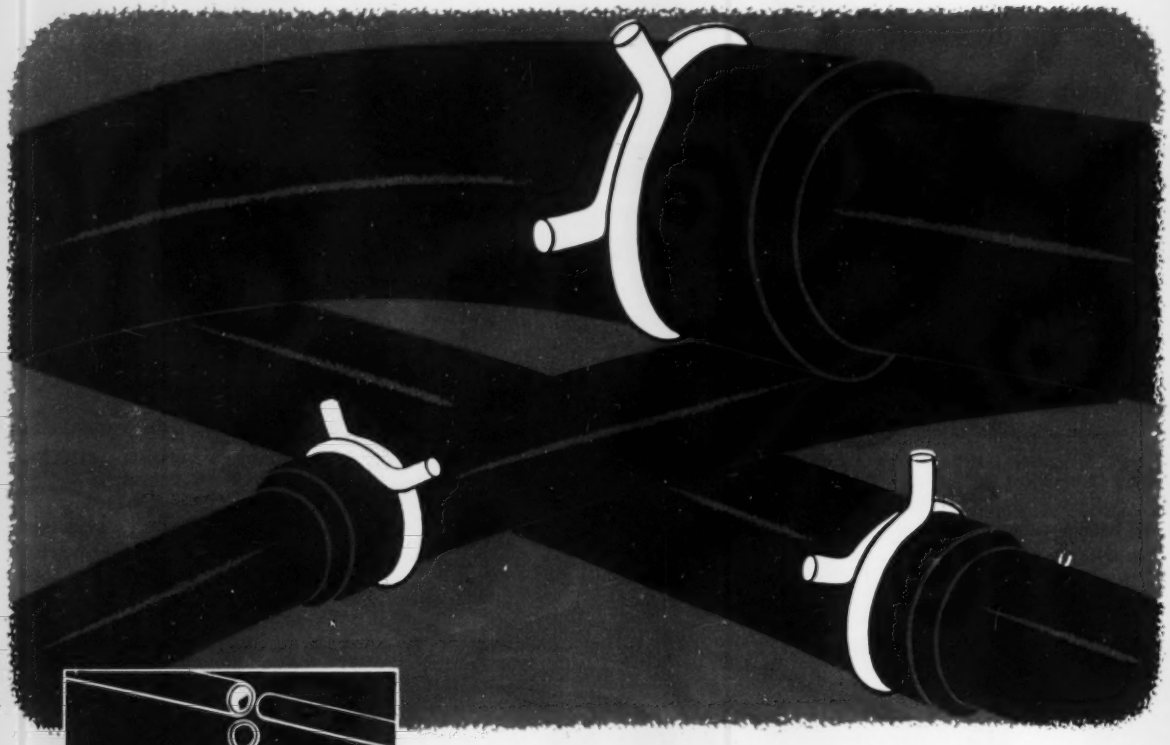
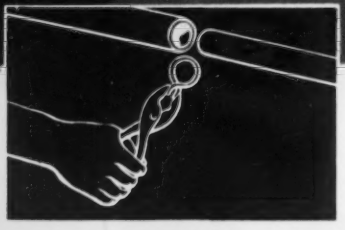
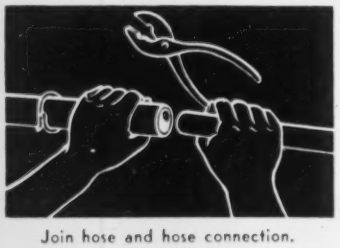




Squeeze clamp open; slide over hose.



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Production AND Engineering NEWS AT A GLANCE

ATOMIC POWER PROTECTION—Atomic Energy Commission's project near Portsmouth, O., will get 18 of the world's largest circuit breakers each with an interrupting rating of 25 million kva at 330 kilovolts. Westinghouse is producing the $2.5 million order. Operating in connection with sensitive relaying equipment, the breakers will automatically remove short circuits or faults within one-twentieth of a second after trouble occurs. Within a third of a second, when so desired, the breaker will reclose, re-establishing service if the fault has disapppeared.

HOMEMADE CARBIDE TOOLS—They purchase only the cemented carbide tips at Solar Aircraft then mill braze and sharpen their own tools. Work on high alloy steels formerly necessitated a carbide tool inventory valued at $40,000, and changes in design or production methods often left a large segment of the inventory practically useless. Today, six employees in the tool grinding department turn out 1400 to 1500 tools per month, at about half the cost of purchased standard tools. Shelf inventory is limited only to the carbide tips, and as additional supplies of tools are needed the department makes them to order. They've got their own system of tool numbering, so duplication is a simple matter. p. 82

BETTER AMMUNITION LOADING—High voltage fluorography combined with rapid automatic film processing, may show the way to lower cost and faster techniques for production inspection of melt-loaded ammunition in ordnance plants. Key to success of the technique lies in the discovery that flourescent screens are capable under certain conditions of a highly discriminating brightness response at radiation intensities on the order of 2 million electron volts, even though this energy is far above their usual peak response energy.

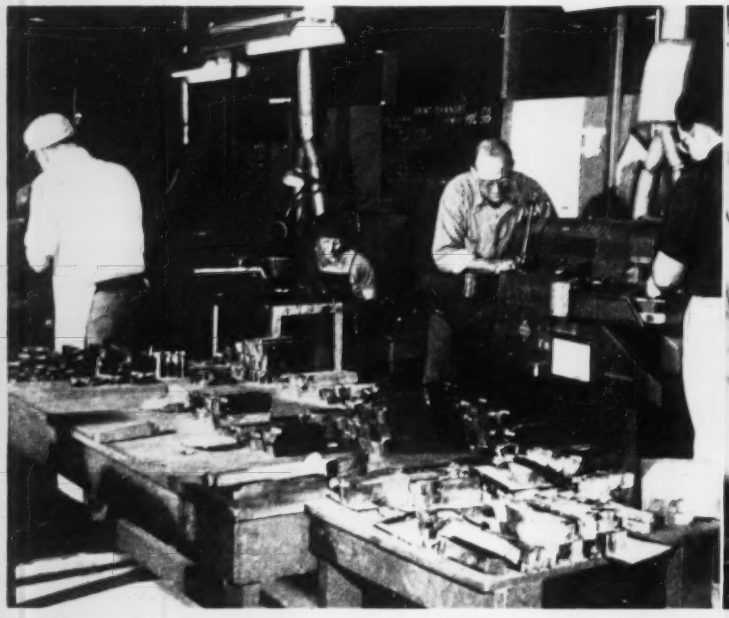
PROPELLER POWER—An aircraft propeller incorporating the widest blades ever built is in limited production at Hamilton Standard Division of United Aircraft Corp. When mounted on a 5500-hp P&W T-34 turboprop engine, it will give more propulsive thrust for takeoff than any other propeller-engine combination in a similar advanced stage of development. Designed initially for engines in the 5000 hp class, the new propeller is the first of a line which in various combinations of numbers of blades can be adapted for engines of more than 9000 hp and airplane speeds of more than 500 miles per hour.

INSTRUMENTS OF TORTURE—Some of the things that electrical instrument manufacturers do to prove the ruggedness of their product is an amazing revelation. For instance, they've built a shock tester which pounds them from all angles with a 400-pound free-falling hammer. That's just a starter; before they're through the delicate looking meters etc. are subjected to harmonic vibration in all directions, 45 minutes of banging and tumbling, temperature extremes, water dunking and humidity-pressure tests. Oh yes, when they're all through, the instrument has to pass an exacting electrical accuracy test. Building ruggedness into this equipment was originally pushed by the military, but industry in general is benefitting now that the trend toward machine-mounted instruments is gaining momentum. p. 84

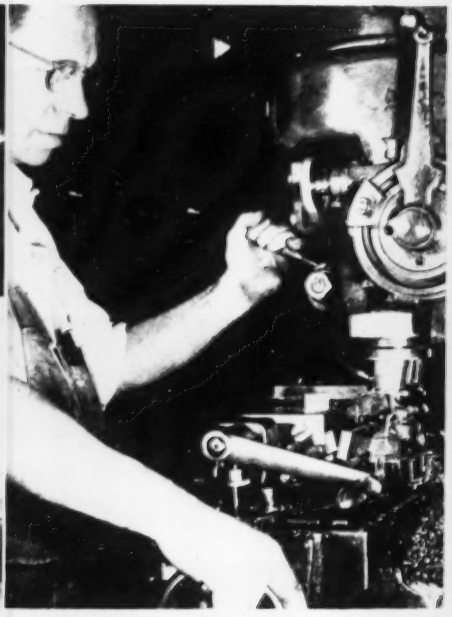
COPPER SUPPLY BOOST—A new way to recover millions of dollars worth of copper from waste mills is foreseen as the result of experiments at Michigan State College. A coal tar product that removes copper silicate from impurities similar to the way soap removes dirt from clothing is the heart of the process. As much as 90 per cent of the copper-bearing mineral contained in samples was recovered in tests. In some cases only one pound of the new synthetic chemical was needed to recover 17 pounds of copper as copper silicate. Only the copper bearing mineral is recovered in the process and standard commercial processes must be used to produce pure copper.

HIGH PLATING OUTPUT—With more than 1200 different small parts to be plated, mostly for corrosion inhibiting, Ford's Rouge plant has a separate building next to the heading department which does the work efficiently and rapidly. Three automatic barrel plating machines, each capable of an output of 3100 pounds per hour, do the job, and each is arranged for rapid hand controlled feed and automatic discharge. Even moving the barrels into and out of the machine is easy on manual labor. Gravity roller conveyors move the barrels, and electric hoists elevate and dump parts into hoppers that feed the plating machines. p. 88

NO LONGER FORGOTTEN—For some years and with some justification, the operators stationed in the mill control pulpits considered themselves as the forgotten men of the steel industry. They had the exacting job of keeping bigger, better and faster equipment rolling steel to exacting specifications but had to do their work under conditions far from ideal. Modern mill control pulpits produce higher efficiency, lower labor turnover and a general dressed up mill atmosphere. They are engineered to suit each condition and are insulated against heat, have accoustic ceilings, sound deadening heavy steel walls and floors, indirect lighting and concealed wiring. Other features include: Air-conditioning, special operator's chairs, intercommunication sytems, industrial television, etc. You can hardly blame the mill superintendent if he drops in often and stays a while.



Carbide-tipped tools are fabricated, ground and repaired in this department. Savings result from doing the work in the user's plant



Tool shanks are cut to length from bar stock. Here seat for carbide tip is being milled in

CARBIDE CUTTERS:

Made and Maintained at Home

Purchasing only the cemented carbide tips an aircraft company mills, brazes and sharpens its own tools. It saves as much as $50,000 a year

By MARTIN S. SCHLEGEL
Chief Tool Engineer
Solar Aircraft Co.
San Diego, Calif.

WORKING almost exclusively with high alloy steels, Solar Aircraft Co., San Diego, Calif., finds the program of grinding its own carbide tools is paying handsome dividends.

This machining on tough alloys calls for large quantities of expensive cutting tools. In the past, Solar had to maintain an inventory of cemented carbide tools valued at over $40,000.

Wasted Inventory — In addition to the money tied up in tools, there were other drawbacks. Often changes in design or production methods would leave a large inventory of tools that were practically useless. There were so many special machining operations that many times the work needed to remodel a standard carbide tool was almost as much as to make the tool originally. Again, it was difficult to get tools in a hurry when they were required for use on special jobs.

Today, a half-dozen employees in the tool grinding department make 1400 to 1500 tools a month. They turn out these cemented carbide cutting tools at about half the cost of purchased standard tools. Practically no shelf inventory is maintained, except in cemented carbide tips. Instead, every cutting tool is numbered—there are about 1000 different shapes and sizes currently in use, of which 200 are standard tools and 800 are special and as additional supplies are needed, the tool grinding department makes them to order for the specific purpose.

Eleven Types—Department buys cemented carbides as sintered tips of various shapes and sizes. They are obtained from four different suppliers—Firthite, Carmet, Vascoloy Ramet, and Carboloy—altogether eleven different types of

cemented carbide are obtained from four different suppliers.

Supplies of sintered carbide tips are kept on hand. As new tools are needed, tool steel shanks are milled to correct size, with an opening for the carbide tip. Next, the carbide tip is brazed onto the shank. This is followed by a rough grind of the tip, and by semi-finished grinding. In both these operations silicon carbide wheels are employed.

Close Check — Finally, finish grinding is done as required on a diamond wheel grinder. Dimensions of the tool are then inspected, and those with close tolerances are checked, using an optical comparator. The tools are then dipped in a plastic to protect the cutting surfaces.

Adjoining the tool grinding department is the tool crib, with open shelves separating the two units. On these shelves are finished tool stocks and from either room, the quantity on hand of any particular tool can immediately be seen by the workers.

In Line—Entire operation is on a straight line production basis, with a minimum of moving from place to place, and no backtracking. Grinding department is set up as a complete separate operation, not included as part of a general tool shop.

Machinists need not even visit the tool crib for cutting tools. An employee with a cart stocked with various tools regularly tours the plant, picking up dull tools and replacing them with newly made or sharpened tools.

In fact, throughout the entire San Diego plant there is not a single grinding wheel for tool sharpening except in the tool grinding department. Absolute uniformity is thus maintained.

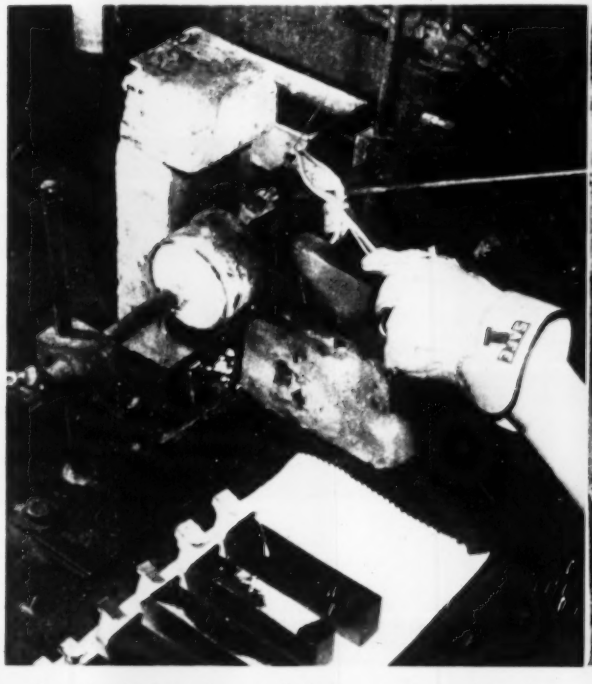
Reclaimed Bits—The fact that for three years Solar has been making its own carbide cutting tools, at half the cost of purchased ones, is not the only saving. In the past, when tools were worn out, tool steel shanks with the remaining carbide were scrapped. Now used carbide tips are removed and shanks of worn-out tools are milled and reused over and over. And the salvaged carbide tips are resold by the pound.

With many special tools there are still other savings. It is possible to have a tool in operation in a few hours for a special job. Often in the past Solar purchased a standard cutting tool and, to get the required sharp angle to the tip, was forced to grind away a large amount of carbide.

Quick Test — Now, in making these tools, an appropriate tip is simply brazed on the shank at the correct angle, practically eliminating the excess grinding. And, for special jobs, various types of carbide can be easily tested to get the best one for the job.

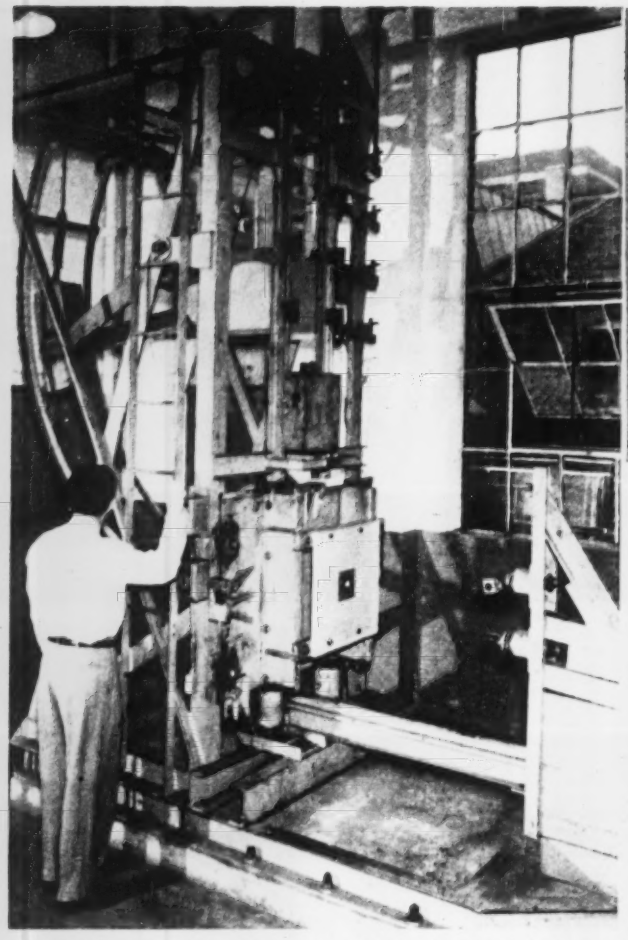
In addition to the making of cutting tools, of course, tools are resharpened by the tool grinding department. Solar estimates that the average tool is sharpened from 15 to 50 times before it is completely worn out. Between each regrinding, the average tool is used to remove 30 to 40 cubic inches of alloy steel in some machining operation. To handle the brazing of the carbide tips, Solar built its own furnace at a cost of $75.

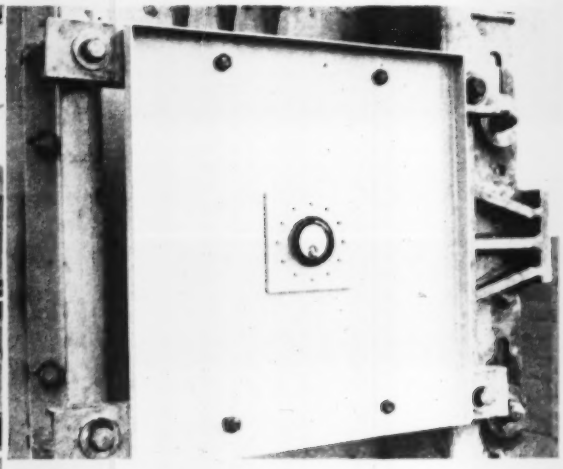
The firm is sold on the speed and efficiency of the system. About 85 per cent of all cutting tools used in the plant are cemented carbide and are passed through the sequence of operations.



After shanks have been milled, tips are brazed in place. Tools are fluxed and the tips brazed in this gas furnace

After tips are brazed they are rough ground on a silicon wheel. Then they come to a diamond wheel for finishing





Shock test is performed on this machine by free-falling 400-pound hammers. The closeup shows instrument mounted on the vertical test panel ready to receive the varying test blows

Electrical Instruments Can Take It

Punishing tests used by top manufacturers to meet military specs help the trend toward machine-mounted instruments in other industries. They're rugged if they pass these tests

TREND toward machine-mounting of electrical indicating instruments is accelerating the need for the same rugged construction that the military services require. Shock, vibration, temperature and moisture are only a few of the adverse operating conditions under which this apparatus must function and retain accuracy, too.

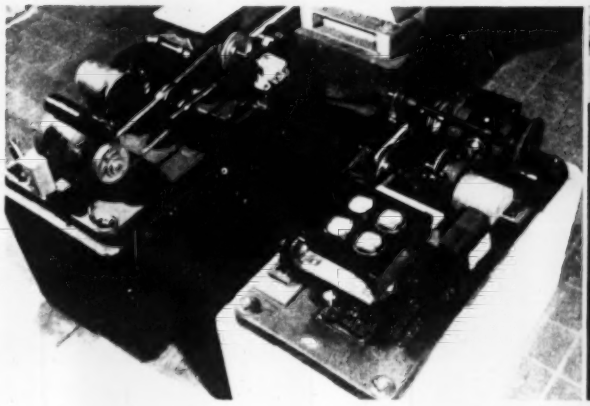
Tests such as those devised at Weston Electrical Instrument Corp., Newark, N. J., torture instruments on an array of equipment that can exceed the severity of almost any application found in industry. Some of the things Weston and other instrument manufacturers are doing in their testing laboratories would bewilder their forebearers who concerned themselves mainly with electrical characteristics.

Shock Testing — Probably the most impressive equipment is that used for shock testing. Instrument to be tested is mounted by standard hardware on a vertical test panel and is then subjected to a total of nine blows up to 2000 foot-pounds in intensity. Blows are delivered by two hammers weighing 400 pounds each; one swings on a 5-foot arm to deliver side blows and back blows to the test panel, the other drops like a pile driver to strike an anvil on top of the test panel and thus deliver a top blow.

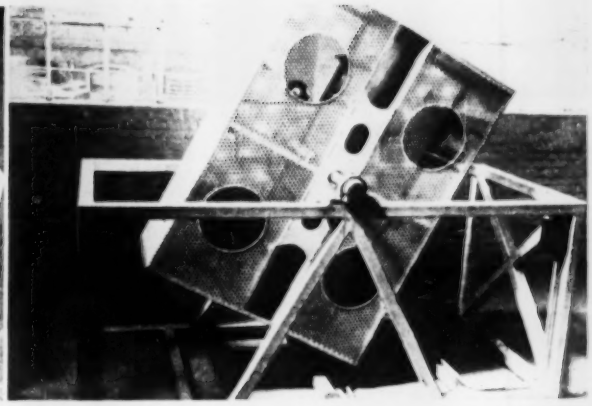
Mounting of the instrument, the height to which the hammer is raised, and the number of blows are all stated in the applicable instrument specifications so that all manufacturers use identical machines in an identical manner. Considerable head room, a heavy foundation and a somewhat isolated location are required for this machine because of the size and noise involved.

Harmonic Vibration—While vibration tests aren't new, machines which impart simple harmonic vibration in either a vertical or horizontal plane are a result of subsequent military specifications. Two such machines are in use at Weston, one with a work table that vibrates horizontally and the other vertically. These machines permit vibration of an amplitude up to 0.1-inch and at frequencies from 10 to 55 cycles per second.

Motor-driven cam automatically changes the frequency over this range once every minute. Manual control is also available if other frequency combinations are de-



Harmonic vibration, both vertical and horizontal, is set up in these machines. The frequency from 10 to 55 cycles per second is automatically varied every minute



Tumbling test really bounces the instruments around. Machine is rotated at 5 rpm for a period of 45 minutes, and free drop within each compartment is about 12 inches

sired. As in the case of the shock test machine, heavy concrete bases are required for mounting.

Tumbling Test — The random jouncing, falling, bouncing and tumbling that an instrument might receive in some severe application is duplicated in an exaggerated fashion in tumbling machines. The instrument to be tested is fastened in a cylindrical sleeve and placed in one of the compartments of a box-like structure that is rotated about its center. In rotating, the instrument is dropped from shelf-like projections within the compartment.

Average test is 45 minutes long, and the speed of rotation is five revolutions per minute. Drops from one shelf to another in the compartment are 12 inches, which means that during the test period the instrument in effect tumbles down a flight of 450 steps, each one foot high.

Temperature Test, Too—Instruments for use in the temperature range of −55° C to +85° C, the frigid arctic to the torrid equator, are now possible. Weston has a wide selection of cabinets capable of testing for these extreme temperatures. Heated electrically to obtain the high temperatures, these cabinets are equipped also to reach the low temperatures either through mechanical means or dry ice.

Maintenance of the desired temperature within close limits is achieved through automatic temperature recorder controllers. Windows in the cabinet permit observation of the instruments during the test.

Moisture and Water Proof — Moisture resistance is a must, so instruments are tested in a cabinet where temperatures range from 2 to 80° C with relative humidity up to 95 per cent. Automatic control gives predetermined cycle of specified temperature and relative humidity, and both are read and recorded throughout the test.

Instruments must be water tight, too. To make sure, they are placed in a water-filled test chamber and pressure is reduced to 2.5 inches of mercury (absolute), by motor driven vacuum pump. Tests last as long as four hours, and here again recorder-controller machines maintain and record the test conditions.

Electrical Checks — In addition to the testing equipment already described, instrument manufacturers must maintain a wide range of electrical equipment to accomplish calibration, checking, and testing of the electrical characteristics. This equipment includes precision potentiometers, standard cells, standard resistances, transfer standards, instrument potential and current transformers, bridges and regulated power supplies of various alternating and direct current voltages.

Also available is equipment for dielectric strength and insulation resistance tests, oscillators for frequency error testing, and large current carrying coils or loops for magnetic influence or external field influence tests.

Temperature cabinets permit study of instruments under arctic or tropical conditions. To attain lows of −103° F takes 50 hp of motor capacity

On Jan. 19 STEEL announced a Specifications Handbook based on the new Cross Index of chemically equivalent specifications and identification code. Response from industry has shown there is a real need for this complete rundown on metal specifications. Presented here are additional facts on how this valuable reference came to be.

Teamwork Smooths Out Specifications Troubles

Standardization trend advances on many fronts. Cross Index of chemically equivalent specifications is first major compilation from military agency. More will come

MUCH OF THE CREDIT for victory in World War II was due to the close relationship between the military departments and American industry. Productive strength of our plants, properly applied in the battle zones by the military gave victory.

Today, industry-military co-operation continues to work. Objective: To make defense efforts more productive. One line of attack which promises to pay real dividends is work on standardization.

Taking the lead for the military in the drive toward standardization is the Defense Supply Management Agency. Created by Congress in July 1952, it is in the business of providing the tools for effective military supply management.

Trend toward standardization of our productive potential is also evidenced on many fronts by work of special industry teams and task forces.

Standards Authorized—The Defense Cataloging and Standardization Act passed by Congress last year gave DSMA responsibility for: 1. Cataloging all items of supply used by the military department; 2. reducing the variety of such items through simplification studies; and 3. issuing specifications and standards covering required items. Furthermore, the agency is to see that all inspecting and testing facilities are used to best advantage and is to unify, where practical, the methods of packaging employed by the various military activities.

Of equal significance the agency is charged with improving relations with industry as regards the supply management activities of the Department of Defense.

Responsibilities Broken Down—DSMA absorbed the former Munitions Board Cataloging Agency and Standards Agency when it was created. It is headed by Joseph W. Fowler, a former admiral, whose career centered about Navy industrial activities.

Fowler organized DSMA to meet its responsibilities by setting up three policy-making co-ordinating offices: Office of Cataloging; Office of Standardization; and Office of Inspection. Operations in all three areas are conducted by assignment to elements of the military departments having major interest and the best qualified technical personnel to meet a particular problem.

DSMA offices set policy, establish procedures and control programs for meeting the obligations of the law. Packaging matters are handled by the Packaging Division, Office of Standardization.

Industry Men Help—Recognizing industry's interest in the effectiveness of its program, DSMA makes extensive use of industry advisory committees to meet specific problems. Such committees now exist on internal combustion engines, power cranes and shovels.

air conditioning and refrigerating equipment and packaging.

Generation of reference works valuable to industry is corollary to the tasks of establishing and maintaining a single military supply catalog, a unified Department of Defense series of specifications and standards, and standard methods and procedures for inspecting, testing and packaging military supplies.

What Has Been Done—The Office of Cataloging has prepared and issued: The Federal Code for Manufacturers; Directory of Metalworking Machinery; The Coded List of Materials.

The Cross Index of chemically equivalent specifications and identification code, which is the basis of the Specification Handbook just published by STEEL, is the first reference work compiled by the Office of Standardization. The complete document will be known as DSMA-M1 by the Department of Defense.

New Cross Index—In 1951, recognizing that a similar document issued during World War II was obsolete, the military departments asked the Munitions Board Standards Agency to bring it up to date and reissue it. The Department of Air Force was assigned responsibility for this task and contracted with the General Motors Corp. to undertake compilation of this data. Late 1952 saw approval of the manual by Office of Standardization.

The opportunity for STEEL to bring its edition of this reference work to its readers as the Specifications Handbook was made possible only through the co-operation of Air Force, Army, Navy, General Motors, Defense Supply Management Agency, and Superintendent of Documents.

Common Denominator—Basis of the Cross Index is a single five-digit number for ferrous and nonferrous alloys of similar composition covered by a variety of specifications. It thus provides a reference by which the material compositions of different specifications may be compared.

The materials covered by the specifications included in the new Cross Index are the ferrous and nonferrous metals and alloys. Each specification is assigned a code or group number which is common to all other specifications for materials of similar chemical composition.

Chemical Composition—In the first part of the Cross Index, groups of specifications for material of similar chemical composition are arranged in the numerical order of the code numbers assigned to each group of such specifications. Four items of information are listed for each specification: 1. Specification designation or symbol; 2. general form of shape of material specified; 3. the initial which designates the agency which issued the specification; 4. detail chemical composition expressed as percentage by weight of the material required by the specification.

Specifications Listed—The second part of the Cross Index lists specifications for ferrous and nonferrous metals. The specifications listed by each agency are given separately.

Table II in the Handbook shows specifications included in the Cross Index. They are listed in alphabetical or numerical order with this information: 1. Specification designation or symbol; 2. code number which has been assigned and which serves to index the specification in Part I; 3. the complete title of the specification.

The Specifications Handbook published by STEEL is based on detailed chemical compositions as given in the first section of the Cross Index code and does not include nominal compositions. A special section in STEEL's Handbook also gives the correlation between producer designations for aluminum and specification code number.

Plans Take Life—Program for the new Cross Index was firmed-up on December 27, 1951 at a meeting called by the Munitions Board Standards Agency. Chairman of this meeting was MBSA's B. Rosenzweig. Members of the different services were present to assist in rounding out the job.

Outcome: Department of Air Force was assigned front line responsibilty for the task. Work was done by R. L. McWilliams at General Motors under research and development contract (33-600)-6852 with the Air Force. Working closely with the GM project were: A. W. Sumpter, civilian chief, requirements branch HQ air material command; Maj. M. L. Campbell, U. S. Army G-4; Cdr. Harold B. Goodwin, U. S. Navy BuShips, and Maj. W. S. Ferguson and D. B. Sullivan, Wright-Patterson Air Force Base.

The demand for STEEL's new Specifications Handbook has exceeded all expectations. Thousands of requests have already flooded our Readers' Service Department and more are being received every day.

If you missed our original announcement January 19, we'd like to review the manner in which the Specifications Handbook is being made available.

1. **Every STEEL subscription is entitled to one free Specifications Handbook as part of that subscription. For example:**
   a. **If the subscription is in your name, you are entitled to a free Specifications Handbook . . . a sort of 53rd issue . . . as part of that subscription. If you have already requested your copy, it is on its way to you by now.**
   b. **Every new subscription entered during 1953 will also be entitled to a Specifications Handbook at no extra charge.**
2. **Additional copies of the Specifications Handbook will be available. However, our initial supply is being exhausted by the demand from current subscriptions.**

More Handbooks are being printed and, as s on as they are ready, additional copies will be sold at the following rates:

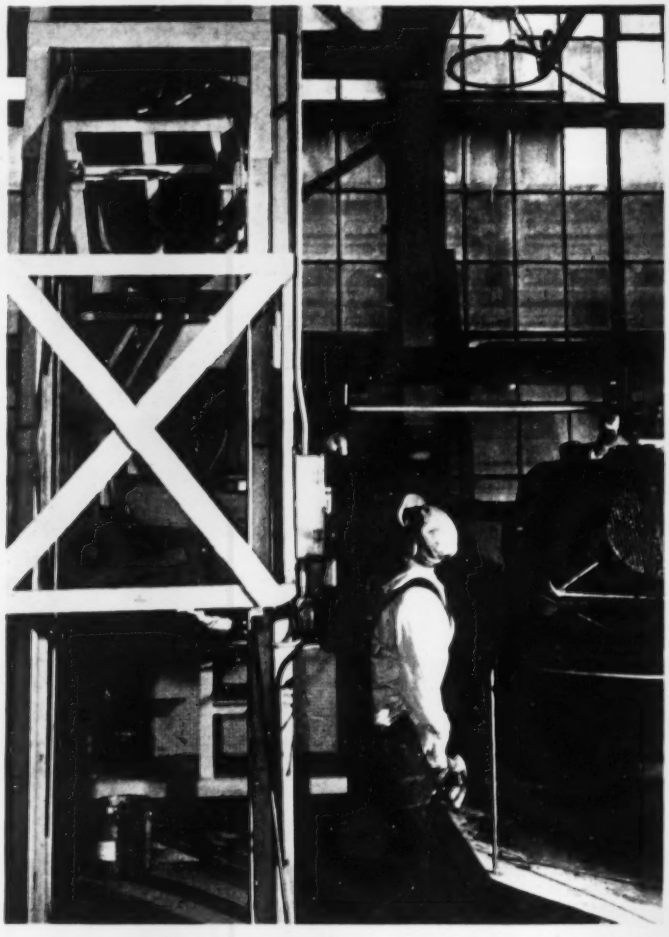
1—10 copies	**$2.00 each**
11—25 copies	**1.90 "**
26 or more	**1.80 "**

All requests for the Specifications Handbook should be addressed to Readers' Service Department, STEEL Magazine, 1213 West Third Street, Cleveland 13, Ohio.

Small Parts Barrel Through Plating

Three automatic barrel machines form backbone of efficient zinc plating line. Special handling equipment reduces handling needs, permits high output

By HERBERT CHASE



Pushbuttons operate this barrel hoist for headed parts to be plated At the top, each barrel is automatically tilted and dumps its contents into a hopper from which parts are fed into plating baskets

MORE than a thousand different parts, chiefly bolts and screws, are produced in a cold heading department of the Ford Motor Co.'s River Rouge plant. Many of these are made in large volume and thousands of pounds hourly require plating with zinc, primarily to inhibit corrosion.

To handle this large volume of plating, a separate building adjacent to the heading department is equipped to do the work rapidly and efficiently. Although an automatic rack plating machine is included and kept busy, it handles only a small volume as compared with three automatic Stevens barrel plating machines each of which processes approximately 3000 pounds of parts an hour. In all, about 1200 different parts are handled through the automatic plating machines.

Minimum Labor—All the automatic machines are arranged for rapid hand controlled feed and for automatic discharge as well as for automatic plating. Each operates in series with a Ransohoff machine that does continuous drying on a completely automatic basis. As a result, direct labor requirements are at a minimum and are largely confined (except on the rack machine) to getting barrels of parts into the machines and removing barrels of parts discharged after plating and drying. Even this labor is light, as barrels are handled on gravity roller conveyors and electric hoists elevate and dump parts into hoppers that feed plating machines.

Acids are pumped into the building from outside storage tanks and solutions are handled by pumps as necessary. Electrolyte is constantly circulated, filtered and kept at desired temperature by automatic means, hence sludge is kept out of plating tanks and they rarely require draining. In an emergency, electrolyte can be dumped into a 15,000-gal tank below floor level and can be pumped back subsequently. It is never discharged into sewers.

Air Flow — Special attention is paid to ventilation. Filtered fresh air is forced into the plant through large ducts above plating machines and exhaust fans draw fumes away through high level ducts above aisles at sides of the machines. This affords rapid and large volume air changes.

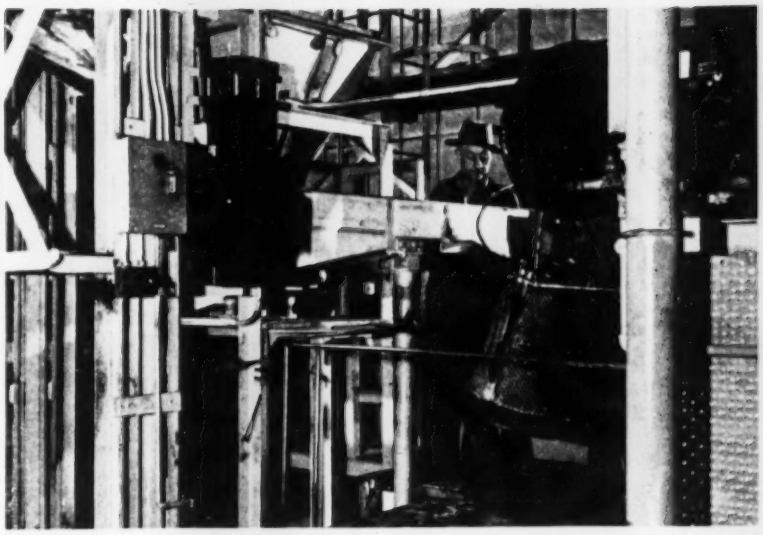
Parts to be plated are received from the heading department in metal barrels and are deposited on gravity roller conveyors near floor level, whence they are moved as needed to electric hoists. This applies to the barrel plating setup as does all subsequent description, as the rack plating machine handles only relatively minor quantities and is operated along conventional lines

with hand loading and unloading of racks.

Barrel Roll—Barrels of parts set in the hoist cradle are elevated by pushbutton. When at proper level, the barrel is tilted automatically and contents discharge into a hopper for feed to the plating setup through a chute equipped with a syntron feeding device. Then the empty barrel is lowered and shifted to a point for subsequent reloading with plated parts.

From the chute, parts feed into the plating baskets at a point where each barrel dips to the loading station. An operator at this point shuts off the feed when the basket is properly loaded. Each basket has a perforated plastic covered steel shell and is supported on a shaft whose position changes as needed in shifting to and from loading and unloading positions and from tank to tank in the plating line. A gear on the shaft engages a rack and rotates the basket where required to keep the parts tumbling to insure uniform treatment.

Electrolytic Cleaning — At the first tank in each plating machine, baskets dip into a 12 to 17 per cent solution of No. 52 North Western alkaline cleaner heated to 180-210° F and remain rotating and advancing through this tank for 5½ minutes. Then they receive a hot dip and spray rinse of ½-minute duration in water heated to 210° F, at the second tank. This is followed by a 5½-minute dip in a 10 per cent sulphuric acid at 140° F, to slightly etch surfaces, and by a cold water rinse for 30 seconds.



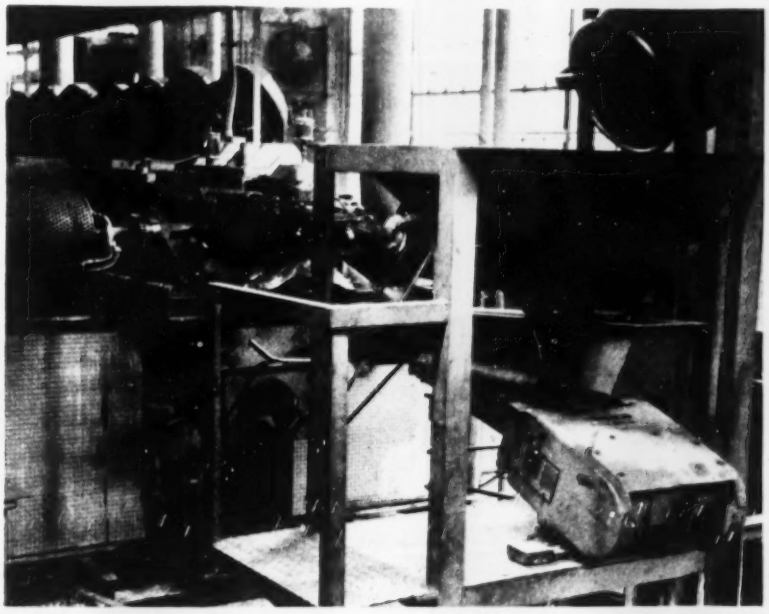
Operator loading a plating basket (or barrel) from the Syntron controlled chute, which is fed from the hopper above it. Each basket passes under the chute to give ample loading time and then shifts above the tank at right

Next, comes electrolytic cleaning in a 12 per cent solution similar to that in the first cleaning but at 140° F. Cleaning is done with the work alternately anodic and cathodic for 1-minute intervals over a total period of 3 minutes during which total current flow is 1260 amp.

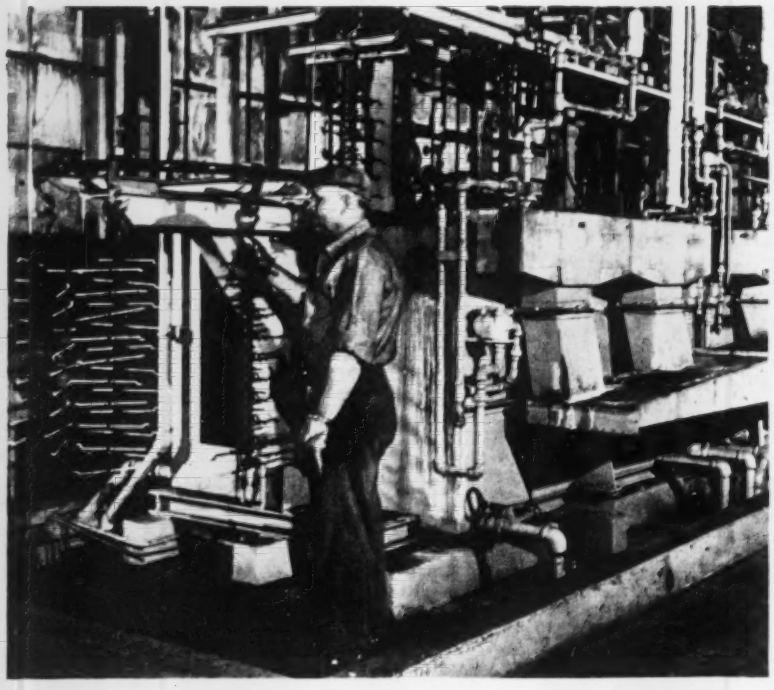
After the 30-second rinse in warm water, baskets dip in a solution containing 4 to 6 ounces per gal of cyanide salts at 80° F for 1 minute. This makes the parts ready for plating and baskets immediately enter the plating tank. There they remain 15 minutes and receive a zinc coating 0.0003 to 0.0005-inch thick.

In this plating, zinc ball type anodes are set in perforated steel containers and the solution is held at 90° F. This is a standard Ford zinc plating solution and contains 12 ounces of zinc cyanide, 4 sodium cyanide and 10 caustic soda per gal. Circulation through the tank, filter and heat exchanger is continuous and the cycle time is 64 seconds. Current supplied is 2000 amp at 12 volts.

Set for Drier—From the plating tank, parts pass in succession through four cold water rinse tanks and then receive a quick in-and-out bright dip in a solution containing 15 ounces per gal of bichromate. This is followed by three cold and one hot water rinses, after which the baskets reach the end of the



Loading end of one Stevens barrel plating machine, left and, at top right, a barrel that has just discharged parts in the hopper below it. Under the hopper is chute with Syntron unit that controls the flow to plating barrels



Racks for this plating machine are loaded and unloaded by hand with parts not adapted to barrel plating. Operation of rack machine is conventional

plating machine and dump into a hopper from which the parts feed into a Ransohoff dryer.

This dryer has a slowly rotating drum into which the parts feed gradually and are advanced by helical ribs as drying takes place. As parts are already hot when they enter the dryer, surface moisture is quickly evaporated, for the drum is kept hot by contact with hot water on its outside surface. Water evaporated from parts inside the hot drum is drawn off as vapor by a suction fan.

At the outer end of the drum, parts feed out gradually into a chute down which they slide into a barrel placed on the roller conveyor to receive them. Baskets of the plating machine, after dumping into the dryer, continue around the circuit until they reach the reloading point and are recharged.

Segregation—In all, more than a thousand different parts are handled through the Stevens machines in batches of different size. Intermixing doesn't occur as the parts remain in separate batches. After a given loading, the hopper is never reloaded with a new batch of different parts until the prior batch feeds out. Consequently, each plating basket receives its own small batch and it remains in this basket until dumped into the dryer near the end of the cycle.

There is, of course, a fixed interval between each basket dumping and dryer speed is so set that a full basket charge will feed out of the hopper of the dryer before the next basket dumps into it. As a result, there is always an interval between the discharge of one basket load from the dryer and the time when the next load starts to discharge. This interval is used to change barrels unless the operator knows that the next lot is of the same part and will go into a barrel already partly filled.

Only two men per machine are needed. One sees that incoming parts are dumped into the charging hopper as needed and keeps parts feeding into plating baskets as they pass the loading station. If he fails to load an occasional basket, no harm results, save a slight loss in total output. Reloading of barrels at the end of the cycle takes only part of the second man's time and he can see that empty barrels are on the conveyor and that those unloaded are pushed along as an empty is put in place.

NBS Studies Copper Strain

STRENGTH, ductility and hardness of copper are markedly affected by its prior strain history, according to a study conducted by National Bureau of Standards. Tensile tests were made on oxygen-free high-conductivity copper initially as annealed, as cold drawn different amounts and as prestrained in creep at 110, 250 and 300° F.

Considerable interest has been stimulated among metallurgists by suggestions that tensile properties of metals are dependent only upon the instantaneous strain state of the metal, and are practically independent of the manner in which this state is attained. Previous NBS work has shown, however, that as some metals and alloys are deformed, hardening and recovery occur in such a manner that subsequent tensile properties are materially affected.

Fast vs. Low Strain—Cold drawing the copper at relatively fast strain rate generally resulted in increased strength and hardness, but in decreased ductility (as measured by the extension and reduction of area at fracture). Prestraining at a high temperature or at a low strain rate, on the other hand, generally resulted in reduced strength and hardness as well as reduced ductility.

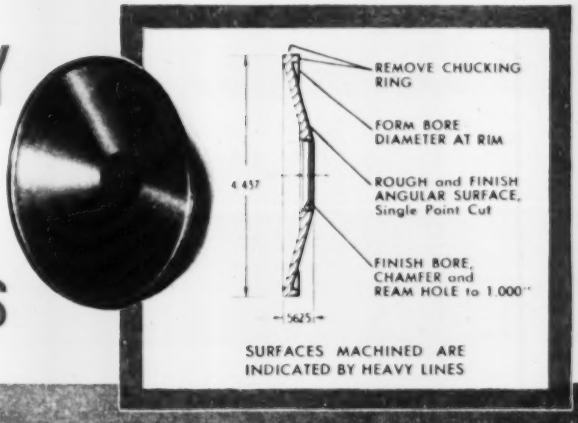
Specimens with the larger grain sizes showed lower yield strengths and hardness values; but grain size had very little effect on tensile strength, fracture strength, and ductility. Hardness values of the fractured tensile specimens, obtained at room temperature, confirmed results of tensile tests.

Further details of the study are included in NBS research paper 2354, obtainable from Superintendent of Documents, Government Printing Office, Washington 25. Price is 15 cents per copy.

Engine Block Machine Built

Completion of a Holeway machine capable of completing 55 operations on engine blocks at a rate of nearly two blocks per minute is announced by National Machine Tool Co., Richmond, Ind. Operations include milling, drilling, combination core drilling and chamfering, reaming, etc., vibrating for chip removal and hole inspecting.

Here's an EASY WAY to machine Forged Steel End Caps


REMOVE CHUCKING RING
FORM BORE DIAMETER AT RIM
ROUGH and FINISH ANGULAR SURFACE, Single Point Cut
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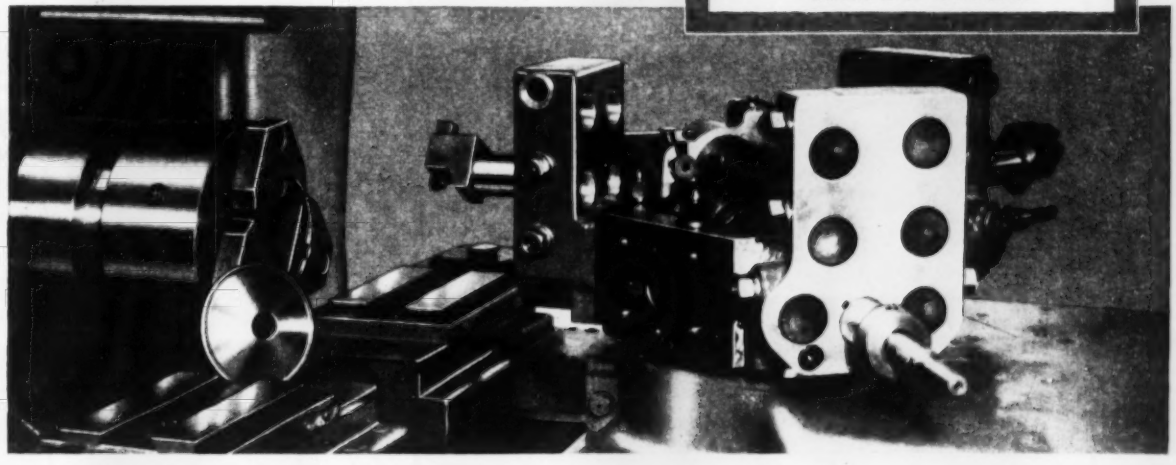
SURFACES MACHINED ARE INDICATED BY HEAVY LINES



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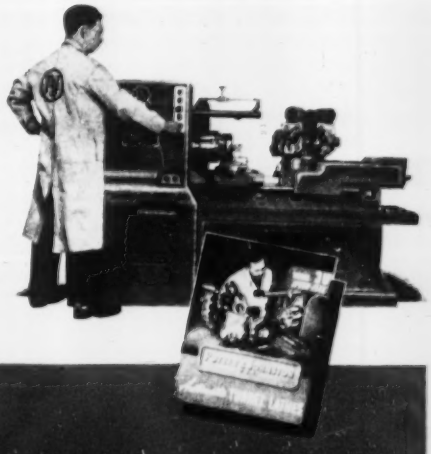
FOR THE ULTIMATE in speed, precision and economy you need **both** P&J Automatics and P&J Tooling . . . industry's outstanding team for higher output, lower unit costs and improved work quality.

Machine your hard-to-handle jobs easier and better, the P&J way. Send today for your copy of the 3U Bulletin No. 145 — or ask the P&J Tooling Engineer to submit recommendations based on your own sample parts or prints.



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Modern Techniques Produce Shell Cores

Close military specifications require an unending series of checks. Attention to principles of mass production keeps tungsten carbide components moving with little manual handling

After carefully weighing out the proper amount of metal powder, it is poured into a mold and is compacted under 60-ton pressure

Cores are placed into graphite containers or boats and covered with asbestos powder for a 10-hour trip through the presintering furnace

TAKING a highly specialized job, the manufacture of anti-tank shell cores, Carboloy Department, General Electric Co., keeps production flowing smoothly by tying in a variety of modern production techniques. Originally developed to pierce the heavy armor of German Tiger tanks the tungsten carbide cores are now being made for troops fighting in Korea and for the defense stock pile.

Two sizes are produced: A 4-pound core for 76 mm shells and an 8-pound core for 90 mm. Both sizes are produced on a pair of special presses exerting a 60 ton pressure for 13 seconds. Compacting of the tungsten carbide follows conventional powder metallurgy practice with the only difference being that paraffin is added to the powder before pressing to help hold their shape.

On the Way—Formed cores are placed four to a tray and ride down a roller conveyor to the presintering furnaces. There they are removed from the light trays and put into graphite boats. Each boat holds ten cores covered with asbestos powder. Excess powder falls into a catcher and is re-used.

Presintering takes place in an automatic electrically controlled hydrogen atmosphere furnace. Transit time through the furnace is ten hours with one boat coming out and another going in every 77 minutes. A rack and pinion arrangement moves the boats through the battery of five furnaces in the presintering line.

Ready for Forming—In the first stage of the furnace the paraffin is burned out and the second stage hardens the cores just enough to permit grinding. On the exit end of the presintering furnace the

Pressure Processing

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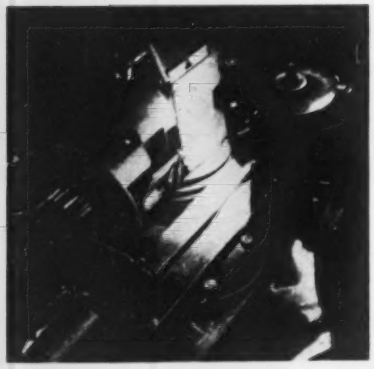
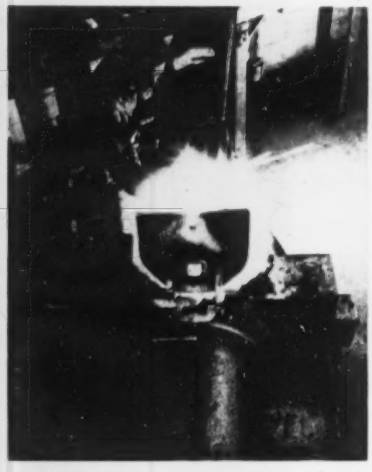


Grinding wheel formed to a special shape provides a bullet shaped nose on core and adjusts it to right length



Four cores are packed into each boat for final sintering. Hinged conveyor sections simplify loading, unloading

boats pass through a cooling jacket where core temperature is lowered sufficiently to permit handling.

At the exit end a vacuum hose draws all the asbestos powder from the graphite boats and is reused. The cores are put on trays and again move on gravity conveyors to grinders for forming the ogive or nose.

Ogives are ground by silicon carbide wheels on Cincinnati No. 2 cutter grinders using a specially formed wheel. Tungsten carbide powder resulting from the grinding operation is collected by vacuum hose for salvage.

Following the grinding operation, cores are given a 100 per cent inspection prior to being loaded into graphite boats for final sintering. Four cores covered with alundum powder go into each boat for the trip through the furnace.

Hardening Trip—Final sintering takes 8 hours with one boat loaded and another unloaded every 57 minutes. Design of the hydrogen atmosphere furnace permits only one end of the furnace to be opened at a time. At both the entry and exit end of all furnaces alternate conveyor sections are hinged permitting easy loading and unloading.

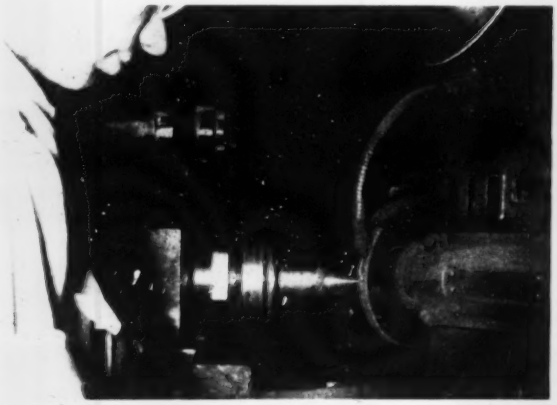
Inspection on a 100 per cent basis at this stage includes a wet-dry weight test for density, a runout test and a length check. Next step is a 40-ton rupture test followed by final machining. Two Cincinnati centerless grinders perform both the rough and finish grind on the cylindrical portion of the cores.

Close Checking—Still another 100 per cent inspection follows, indicative of the painstaking care taken throughout the entire manufacturing operation. Cores that satisfactorily pass the runout test are placed on the outer conveyor line, those requiring slight nose or base adjustment go to the inner conveyor line. Grouping of the cores is according to the required adjustments. Vitrified diamond wheels are used for the work Bases are ground nine at a time to bring the cores to within the tolerances that are specified for length.

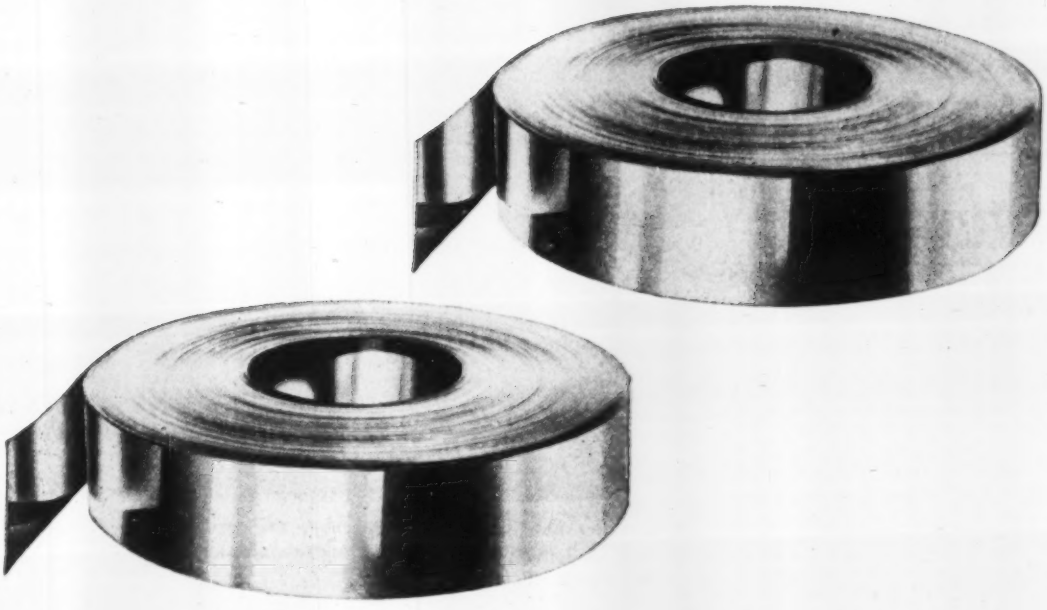
Final inspection checks all dimensions plus taking a Rockwell hardness reading. Cores' average hardness is 83A and rejects at this stage are virtually nil. Despite all the close checks exercised throughout the manufacturing operations, government inspectors take over after Carboloy's inspectors are through. In addition to the dimensional and hardness tests, spot checks are made of the cores by again subjecting them to the 40-ton rupture test under the supervision of government inspectors.

That the care and skill exercised in manufacturing is paying off is attested by the fact that rejects by government inspectors are a rarity. Of even greater importance is the performance of the armor piercing shells in the field where they go through the heaviest tank armor.

Inspector checks core for length while another gets an automatic runout inspection. Rupture test is next step



Cores needing slight adjustments on nose or base are grouped according to work needed. Ogive is ground here



Look alikes don't always cost alike

Two coils of cold rolled steel, side by side, may appear to be identical. The analysis may be the same, the coils of equal weight, both labeled "strip" and both available for immediate usage. One may carry a price tag somewhat less than the other —what if it is a sheet mill product slit to a strip width? Well, if sheet-mill tolerances and finish will produce your end product satisfactorily that's the choice for you because sheet-mill products should cost less than strip. But if you are more interested in end-product cost than first-steel cost, you may be one of those who find that CMP Thinsteel is worth the difference.

CMP strip products in intricate or costly assemblies mean fewer final rejections and thus reduce labor costs. In many applications steel is a relatively unimportant item of cost when measured against labor and fabricating costs. If you can count on the steel being *just right* — as to gauge tolerance, finish, structure, and temper, you insure yourself against troubles outside your own control. In the last analysis you get what you pay for. If you want the best you'll check on the built-in values in CMP strip steel products.

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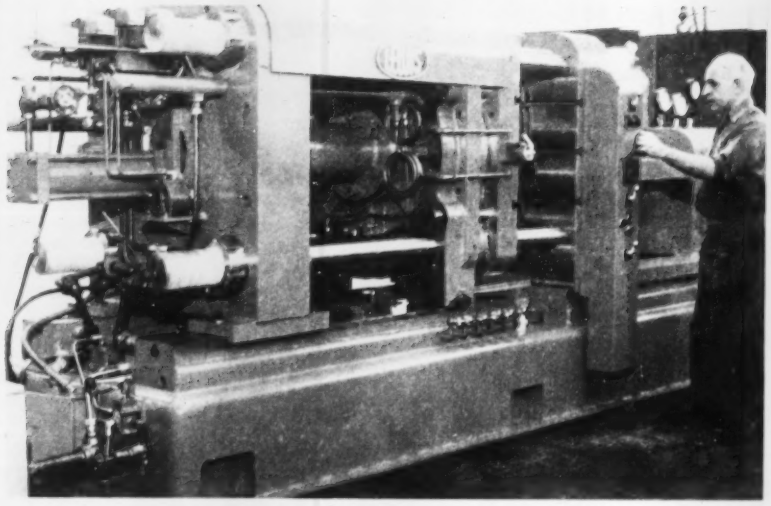
Die Caster Features Two-Stage Injection



In addition to the new principle of injection, the Lewis die forge casting machine has a high pressure die-clamping device exerting 650 tons pressure

Small ram fills die cavity and concentric, larger piston gives final squeeze at 100,000 pounds pressure. Entire casting cycle needs only four gallons of oil

DEVELOPMENT of a new die forge casting machine which makes possible new economies in casting production and brings to the die casting industry a new concept of safe and easy casting operation is announced by Lewis Welding & Engineering Corp., Bedford, O.

This new machine, a result of eight years of research and development, employs the "cold-chamber" method of injection. It introduces however, a new principle which provides for rapid fill while the metal is molten, and high final squeezing pressure that prevents shrinkage voids as the metal freezes and excessive porosity due to air and gases being trapped in the dies.

New Die Clamp—In addition to a new principle of injection, the Lewis die forge casting machine features a novel method of clamping the dies together, known as the Hydra-Lock, which develops a final clamping pressure of 650 tons.

The clamping mechanism of the machine embodies three principal elements. A small hydraulic cylinder advances the platen, on which the moving half of the die is mounted, to a position wherein the die faces are open only a fraction of an inch. A mechanical locking device holds the platen in the closed position. Incorporated in the platen structure is a 28-inch diameter hydraulic cylinder, actuated automatically through the control circuits, which does the final closing of the dies and supplies the final locking pressures.

Short Stroke—The stroke of this large cylinder is so short that only a fraction of a gallon of oil and a few tenths of a second are required for this part of the clamping cycle. High clamping pressure is necessary to resist the high injection pressures which the machine can develop.

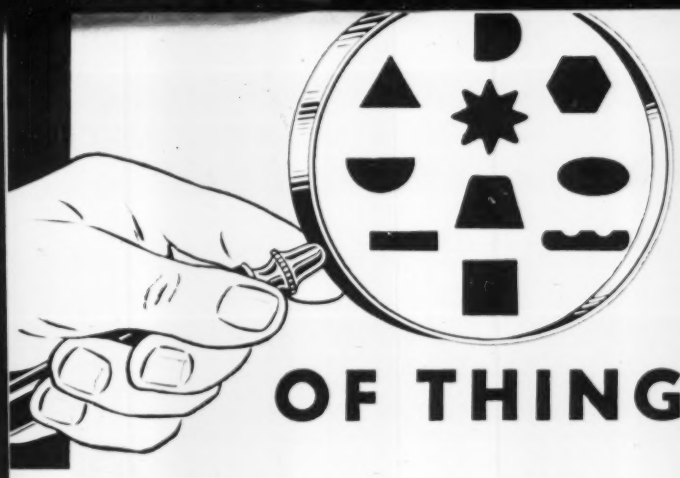
Design of the Hydra-Lock clamping system gives the operator a much easier die-setting procedure and the short stroke of the clamping cylinder and the liberal clearances in the guides permit quick line-up of the die faces. Machine tolerates considerably more misalignment of the die faces, but still closes to give uniform bearing across the dies. Clamping cylinder action is such as to provide essentially ball-and-socket action within reasonably close limits.

Two-Stage Injection—The machine develops an injection pressure of 100,000 pounds which is accomplished by a special hydraulic two-stage injection system. Two pistons are employed, one concentric with the other.

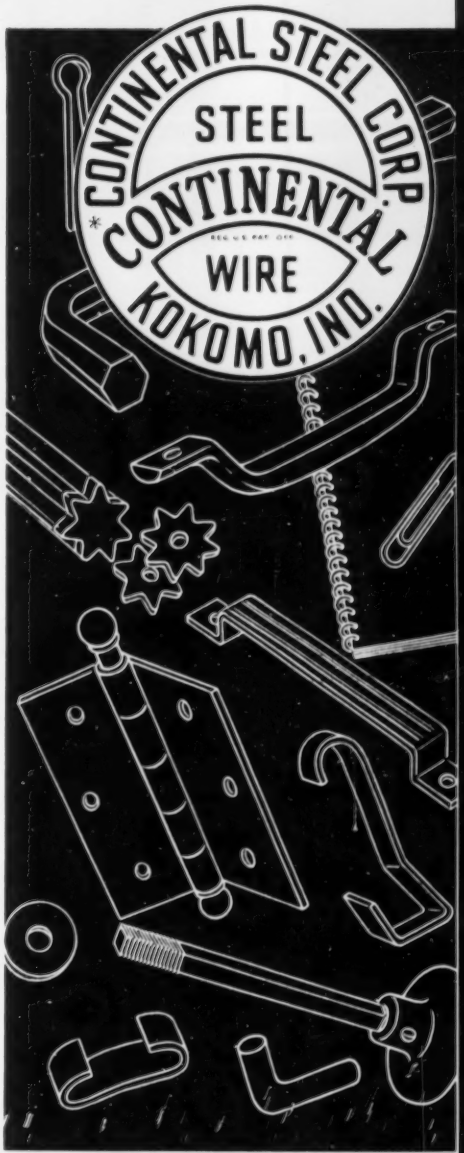
The small diameter piston travels at variable speeds up to 810 feet per minute to fill the die cavity with molten metal. When the die is filled, resistance is encountered and the larger diameter piston is activated. A total pressure of 100,000 pounds is developed with 2100 psi in the hydraulic system. This pressure is the maximum but can be readily adjusted to varying casting requirements.

Greater Flexibility—Flexibility of various die casting operations is introduced by the variable injection speeds and variable injection pressures. These can be adjusted to conform to the actual requirements of the die cavity and the natural flow of the molten metal into the die cavity.

Due to the short stroke of the hydraulic clamping cylinder and the minimum oil consumption of the injection system the complete casting cycle is accomplished with only four gallons of oil. This means minimum heat loss, minimum power loss, and the elimination of oil cooling devices.



THE OF THINGS TO COME...



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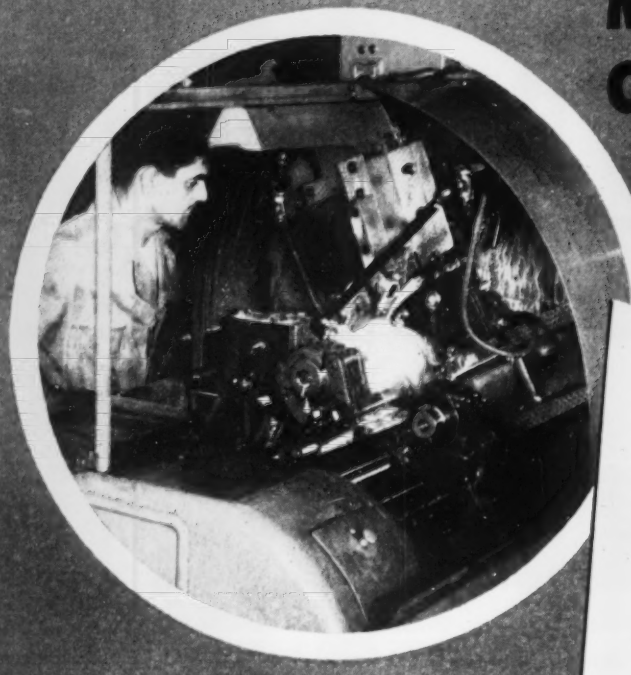
WHAT'S YOUR GUESS ON THIS Machinability Comparison?



ENDURO STAINLESS STEEL BARS ARE —% AS MACHINABLE AS BESSEMER SCREW STOCK

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(a) *42%* (b) *67%* (c) *100%*
(d) *33%* (e) *90%*

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Two grades are fully 90% as machinable as Bessemer screw stock. If 90% was your answer to the question above, you've probably had experience with Free-Machining ENDURO Bars. If you haven't, Republic metallurgists will be glad to give you prompt assistance on applications, processing, and use. Free-Machining ENDURO also is available in hot-rolled bars and in wire. Get more details from your nearest Republic District Sales Office, or write:

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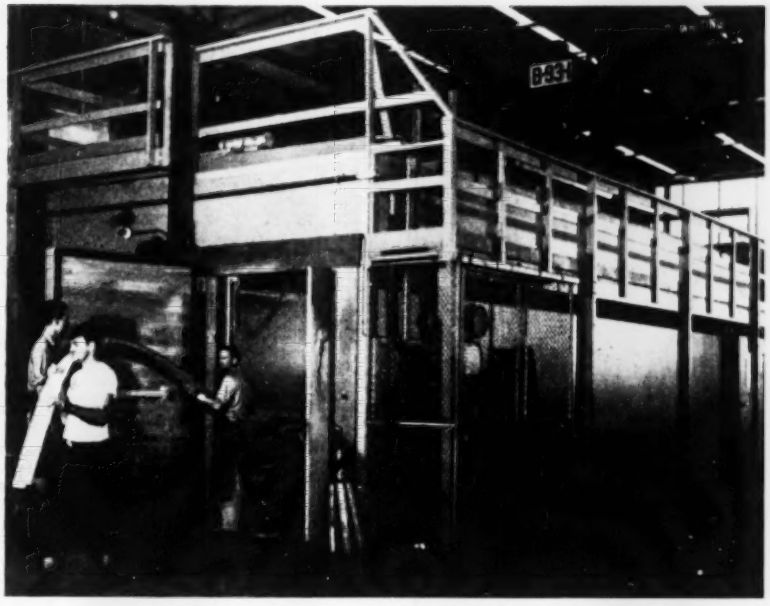


NEW CHAMBER KEEPS COMPONENT BACKLOG ON ICE
. . . production efficiency improves through minimized short runs

Cold Storage Smooths Aircraft Parts Forming

FREEZING, already a valuable manufacturing tool, is becoming an operation of considerable size as well as profitable speed. An example is the 5000-cu ft ice box Lockheed Aircraft Corp. installed recently in its Burbank, Calif., plant for cold storing metal.

Larger than two box cars, this refrigerator deep-freezes metal plane parts to keep them soft between fabrication steps. According to the company, the big-chamber freeze technique results in easier shaping, reduced breakage and smoother production flow.

Capacities, Advantages—The refrigerator measures 40 x 12 feet, is 10½ high. It can cool 2500 pounds of aluminum from room temperature to minus 20°F in about 2 hours. Parts heated to as much as 970°F are quenched, moved into the ice box and frozen. Removed for forming whenever machines are ready, they are still soft and easily workable.

Among production advantages cited by Lockheed is the ability to schedule long runs of identical parts on presses or milling machines by putting a large backlog on ice. This cuts down re-setup and press time on heavy machinery and eliminates delays between heat treating and forming. Scrap is reduced because of parts' improved malleability while cold.

Handling Provision—Adding to convenience, the chamber is located only a few feet from forming machines. To facilitate handling large parts, the chamber top incorporates a door accessible to an overhead crane. This 34 x 4-foot hatch accommodates the bigger pieces, such as the 32-foot-long integrally-stiffened wing panels used on the company's Super Constellation transports.

Longer Life for Furnace Doors

Use of ductile iron for forging furnace doors in a New England manufacturing plant will save that firm about $25,000 a year in shop operations. The interior temperature of the furnaces in this plant is about 1950° F. Doors formerly used required replacement or repair in 6 days because of growth, warpage and scaling.

Trial installations of similar doors cast in ductile iron produced an average life of more than 300 days. Maintenance men, on the basis of this performance, estimate the shop can effect the $25,000-a-year saving by standardizing on ductile iron for doors on all 17 furnaces. Doors were cast by Taylor & Fenn Co., Hartford, Conn., licensed under International Nickel Co. Inc.

ASME Hears Conveyor Tips

Six suggestions for performing necessary operations on package loads at the same time they are moved by conveyors were presented by H. C. Kellers, manager of engineering, Lamson Corp., Syracuse, N. Y., at a New York sectional meeting of American Society of Mechanical Engineers.

They are: (1) Weigh loads while they are moving on conveyors; (2) count loads automatically, if possible; (3) automatically deflect loads so they can be distributed to various buildings, floors and floor areas; (4) use up-enders, down-enders and automatic vertical conveyors to place the units being conveyed directly into machines, instead of simply bringing the units to the vicinity of the machine; (5) use conveyors as live storage—keep work moving to eliminate unnecessary loading and unloading between operations; (6) use conveyors to automatically segregate and accumulate units into pallet loads, shipping slugs or groups for sealers to eliminate frequent setting and adjustment of sealers.

Mr. Keller also suggested better paper work in handling jobs so that orders, work sheets and the like are at the right place and at the right time for continuous flow of materials through a plant.

Flame Plating Booklet Readied

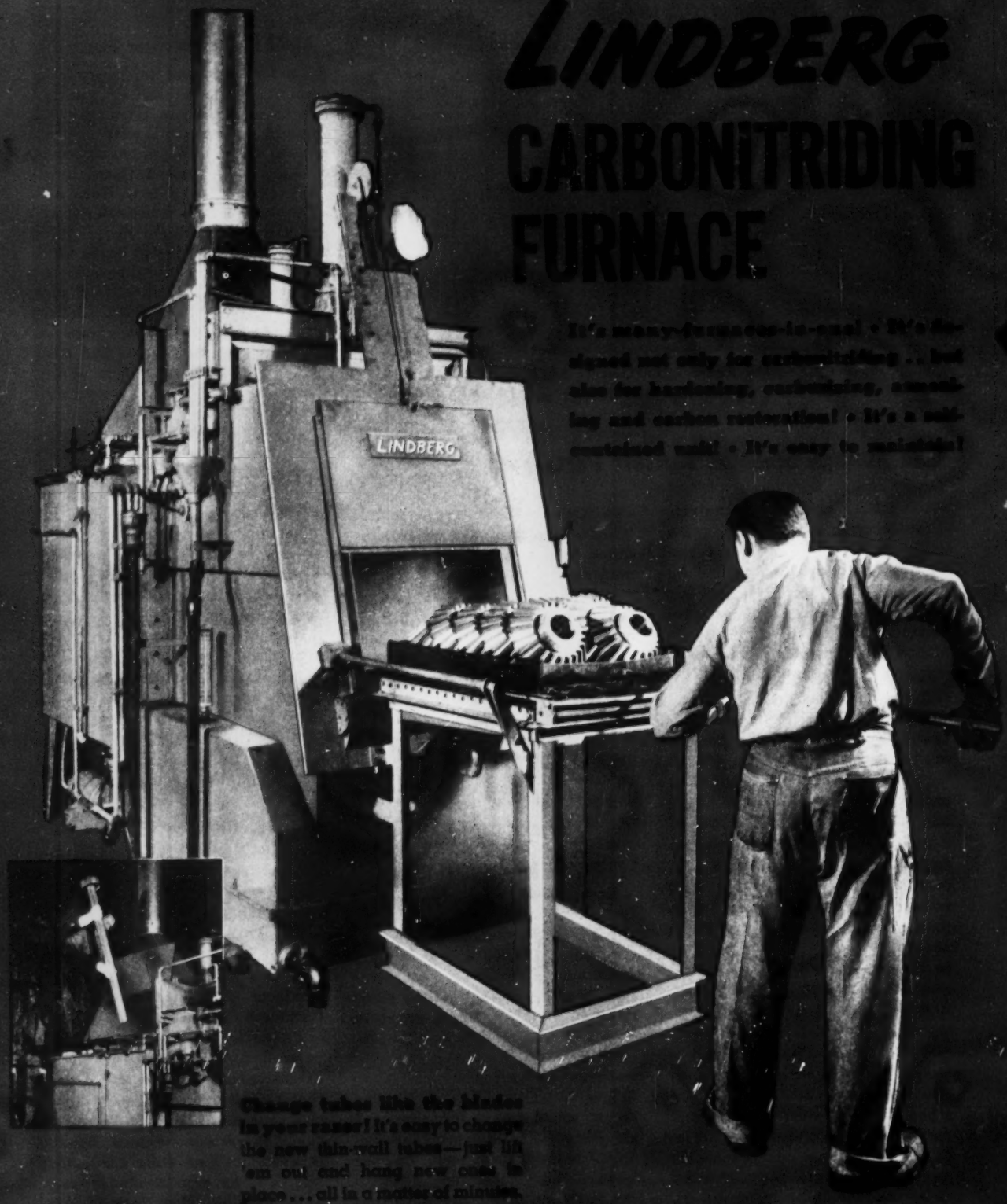
Application of undiluted coatings of powdered metals, such as tungsten-carbide, to metal parts is announced in a booklet describing the features of the new service. The 12-page booklet titled "Flame Plating" is a publication of Linde Air Products Co., division of Union Carbide & Carbon Corp., New York.

Properties of the coatings are covered, as well as the results of extensive comparative wear tests that indicate the excellent wearing characteristics of flame-plated tungsten carbide coatings. Booklet is available free from Linde field offices or company headquarters at 30 E. 42nd St., New York 17.

Here's the new...

LINDBERG CARBONITRIDING FURNACE

It's many-furnaces-in-one! • It's designed not only for carbonitriding . . but also for hardening, carburizing, annealing and carbon restoration! • It's a self-contained unit! • It's easy to maintain!



Change tubes like the blades in your razor! It's easy to change the new thin-wall tubes—just lift 'em out and hang new ones in place . . . all in a matter of minutes.

The greatest advance in industrial furnace design and construction since Lindberg introduced the Cyclone forced convection tempering furnace back in 1935!

A 600 lb. load of CRS hex nuts: Carbonitrided .001 to .005", 60 minutes in heating chamber. Temperature, 1500° F.

Yes, you must see the new Lindberg Carbonitriding Furnace. It's many furnaces in one . . . it's easy to maintain . . . it's a self-contained unit.

Check these important construction features . . . features that will improve production quality and volume, and reduce production costs.

Many furnaces in one . . . Furnace atmosphere is provided by the Lindberg "Hyen" endothermic atmosphere generator that is easily adjustable to supply different atmospheres not only for carbonitriding, but also for carburizing, carbon restoration, bright hardening or annealing and normalizing. For annealing and normalizing the heated charge cools in the same chamber used for purging.

Easy to maintain . . . Instead of old style, heavy, unwieldly, horizontal radiant tubes . . . new gas-fired, lightweight tubes (only 29 pounds) are used. They're simple to change . . . turn off the gas . . . get on top the furnace . . . lift out the old tube . . . hang a new one in its place . . . and the thin, rolled metal tubes actually last longer!

Quench tank pit unnecessary . . . Your Lindberg Carbonitriding Furnace is self-contained, including a built-in pitless quench tank . . . thus you avoid costly excavation and piping. But more important, this built-in quench tank minimizes distortion . . . quenching takes place within the furnace structure, by means of a vertically operated elevator. Heated charges are never exposed to the air . . . as is the case when work is transferred from the heating chamber to a separate quench tank. Uniform case depth is assured because each charge automatically remains at heat the same length of time.

Purge chamber . . . A specially designed chamber, built immediately above the quench tank and in front of the heating chamber, receives work load for purging prior to heating.

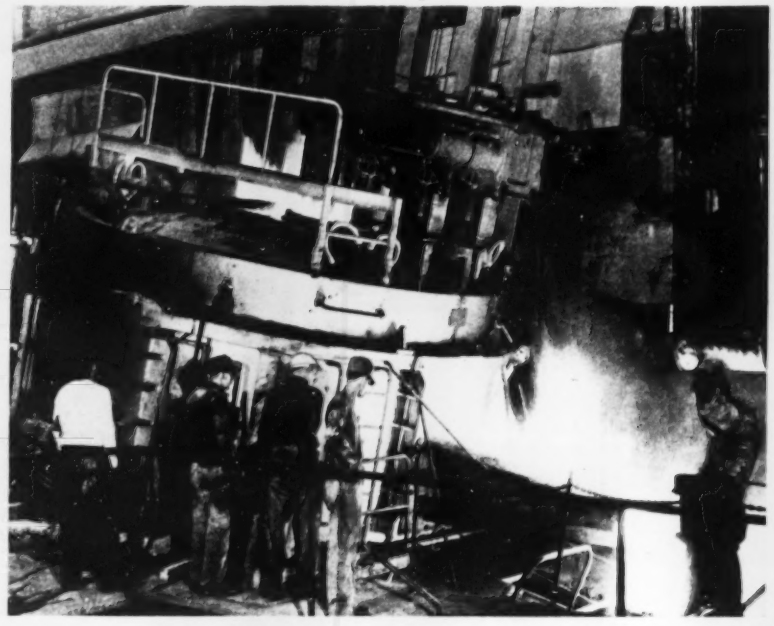
A 1200 lb. load of CRS [illegible]

For full details ask for Bulletin 241

[illegible] Engineering Company 2461 W. Hubbard Street, Chicago, Illinois

LINDBERG FURNACES

Flicker Control in Arc Furnace Power Supply



Pouring a heat of electric steel from a modern arc furnace that is equipped with latest control equipment. Large installations are constantly increasing

First of two articles explaining methods of determining voltage flicker in electric furnace power system and suggesting an interpretation of the results in terms of established light flicker limits

By R. F. LAWRENCE
and
R. L. TREMAINE
Electric Utility Engineering
Westinghouse Electric Corp.
E. Pittsburgh, Pa.

USE of arc furnaces has steadily increased over the past years. At the present time the connected steelmaking arc-furnace load in the United States is approximately 1,400,000 kva. Most of the furnaces have been relatively small, but a few rated 25,000 kva are in service and larger ratings are being actively discussed. With arc furnaces being used for high-grade alloy steel and ingot production, it is apparent that the utility companies will be faced with supplying more of this type of load in the future.

The arc furnace load usually is considered as a good revenue load, because it has a good power factor and a good load factor. However, the wide load variations which occur especially during meltdown make it a difficult type of load to supply because it can cause objectionable voltage fluctuations.

During meltdown the furnace electrodes contact the scrap metal and an arc is drawn, causing high currents of varying magnitude to flow in the supply system. This is the period which might produce objectionable flicker voltages on the system, thus necessitating corrective measures. During the refining stage the arc is more steady and the load variations are less.

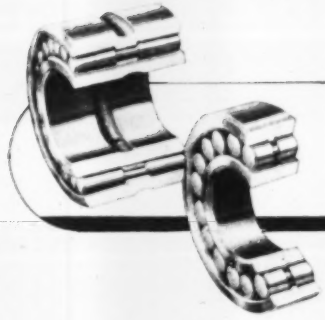
Furnace Function—Electrically, particularly during the meltdown period, an arc furnace can be considered as phase-to-phase "faults" through a fairly high impedance, superposed on a base load. The fluctuating current drawn by an arc furnace produces sudden small voltage changes in the system. The magnitudes of the impedances of the generators, the transformers, and the transmission lines, and the magnitude and phase angle of the current change, will determine how much flicker voltage will occur at the generator bus and the step-down substations.

Ideal solution to the problem of determining the size of furnace which can be successfully applied to a given system, would be a correlation between furnace and system size with number of flicker complaints. Such a correlation requires a survey of existing installations which is not now available. Such a survey is being considered by an AIEE subcommittee.

In lieu of this information, it is necessary to calculate expected flicker and interpret the results in terms of established flicker limits. This paper gives methods of calculating voltage flicker, and suggests an interpretation of the results in terms of established light flicker limits.

The basic information required in the application of an arc furnace can be summarized as:

1. Flicker voltage limits for arc furnaces.
2. Load swings caused by furnace.
3. System one-line impedance diagram.



Over 33% Greater Capacity For The Same Size

There is a challenge facing manufacturers today to build smaller and more compact machines with extra precision and to combine more operations in each machine. This makes the selection of the proper bearings extremely important. A definite plus factor in this selection is the availability of a precision bearing that will deliver extra load carrying capacity in a minimum amount of space.

Obviously roller bearings, and particularly those of the small (needle) roller type occupy far less bearing space for equivalent capacity than ball bearings. Roller bearing capacity is built up in proportion to the effective race and roller contact provided. Thus a full type roller bearing *without space wasting cages* should provide the greatest capacity of any type of anti-friction bearing. However, to offer a perfect bearing the resulting full roller complement must be prevented from skewing and binding where misalignment occurs in the application.

The Guiderol bearing is the accepted answer to all these requirements considering precision, load capacity,

Bearing	McGill Guiderol No. GRI-209	Brand A Bearing	Brand B Bearing	Brand C Bearing	Brand D Bearing
Published Load Rating	8370 lbs.	6700 lbs.	7000 lbs.	5520 lbs.	6080 lbs.

Capacities at 2500 hours average life at 100 RPM

long life, versatility of mounting, and ease of lubrication. Published ratings show the Guiderol CT Series bearing has over 33% greater load carrying capacity than the average of the four highest rated interchangeable bearings. As a result, a Guiderol bearing at least one size smaller can often be substituted with the necessary shaft and housing requirements reduced in size and cost.

How Rollers Are Guided

In the Guiderol bearing design the grooved rollers with full race width contact are prevented from skewing by a center guide rail. Normally the rollers run on a true axis

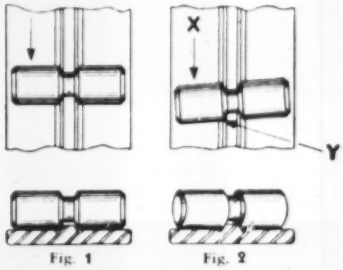
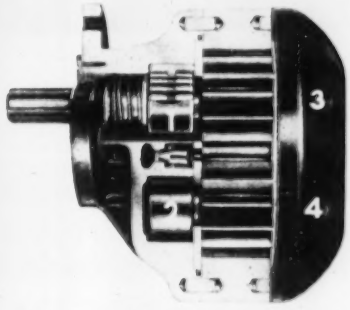


Fig. 1 Fig. 2

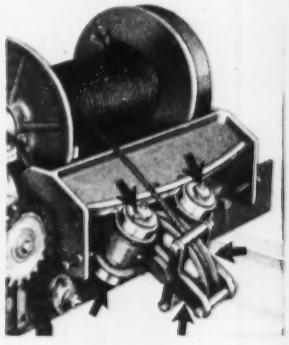
— not contacting the rail and thus need no correcting. (Fig. 1) Should misalignment cause a shift off center (Fig. 2) the leading end of the roller is retarded by contact with the rail at location Y. The trailing end catches up, relieving the rail contact, and the roller then resumes normal operation.

Typical GUIDEROL® Bearing Mountings



On a Hydreco Gear Pump Idler and Drive Shaft, 4 Guiderol bearings are used. The longer rollers of the Guiderol bearings are effective virtually to the edge of the races. This gives substantial support close to the gear and materially reduces shaft deflection.

Four Guiderol bearings support and guide an automatic spooling attachment across the face of the reel track on a 20,000 pound Gar Wood Reel-Lite Winch. The guided roller principle prevents skewing of rollers in the 4 vertically mounted bearings even with a 10,000 pound angular load per bearing. A fifth Guiderol bearing in the sheave provides added stability and eliminates binding due to off-center loading.



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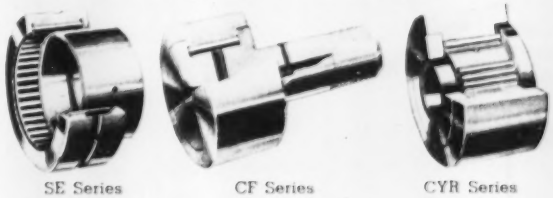

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A new 140-page Bearing Reference Guide complete with 30 pages of vital engineering data has just been released by the McGill Manufacturing Company.

It has the full story on the advantages of Guiderol Bearings and in addition contains complete information on the well-known Multirol CF, CYR and SE Bearings. *Send now for your copy of the McGill Catalog No. 52.*

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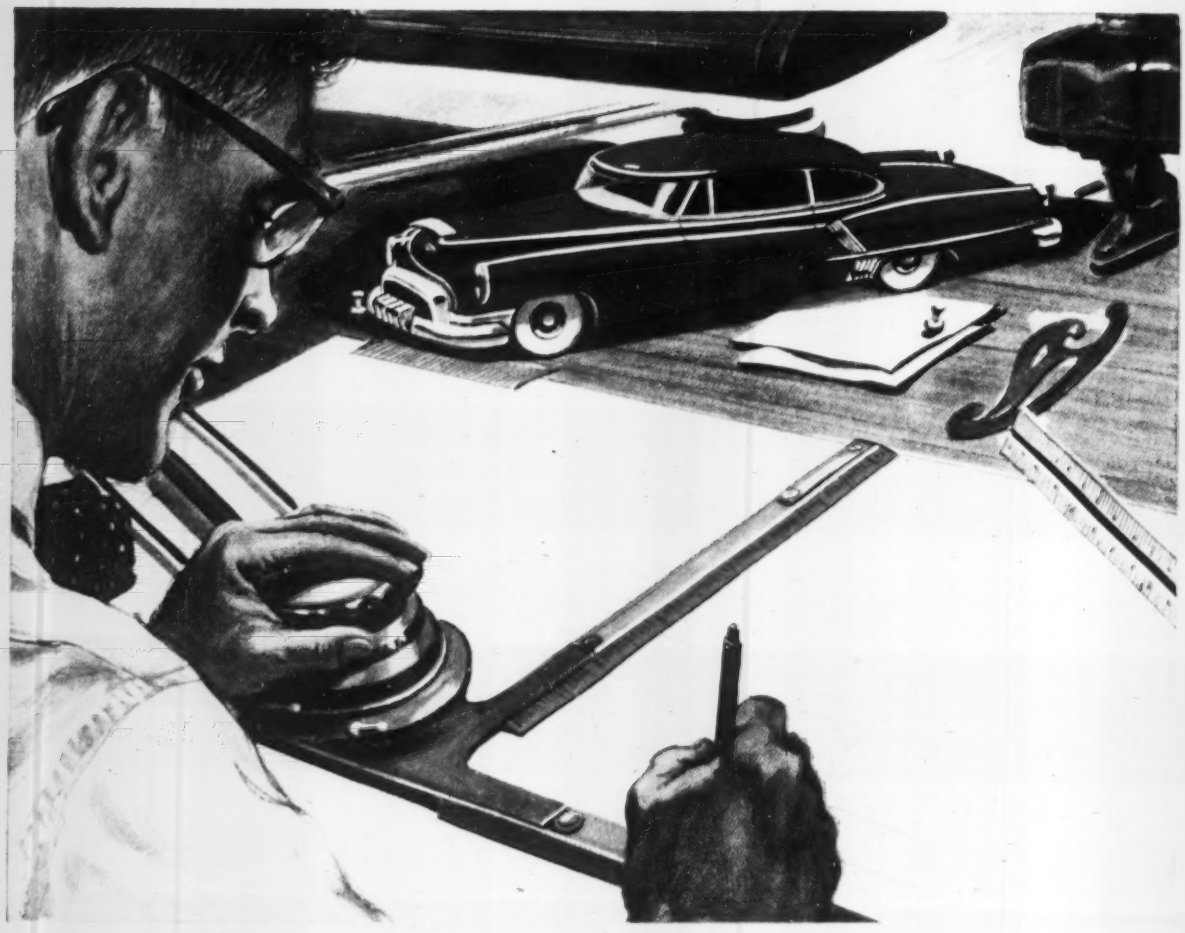

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Flicker Voltage Limits — A change in the voltage applied to a lamp produces a change in its lumen output. The voltage changes produced by an arc furnace are erratic, resembling abrupt and cyclic changes. Cyclic or abrupt voltage changes are termed flicker voltage which transferred to lumen output is know as light flicker.

Permissible voltage flicker is not universally defined nor is it standardized. It is dependent upon the individual observer, the type and wattage of lights, the lighting fixtures and interior decorations, ambient daylight, rate of change and magnitude of change. The human element in the form of the observer, present both physiological and psychological aspects. One individual may perceive flicker but not object to it; contrariwise, another individual may not only perceive the same value of flicker, but find it objectionable.

The rate of change of lumen output and the magnitude of change are important factors. For example, a change of 5 volts occurring once every three hours likely would not be objectional while a change of 1 volt at the rate of six times per second could be objectionable.

Fig. 1 shows various recommended maximum allowable cyclic variations of voltage. This figure is reproduced from "The Visual Perception and Tolerance of Flicker" a report prepared by Utilities Co-ordinated Research Inc., New York, 1937. The greatest sensitivity to flicker occurs between 3 and 12 cycles per second.

Limits Evaluated—In an attempt to obtain some values of flicker voltage limits established by certain utilities, the authors contacted six companies which have arc furnaces on their systems or are familiar with the problem of application of arc furnaces. The information presented here gives a representative idea of thinking in the industry.

In most cases the flicker voltage limits of the different companies are presented in the form of a curve of permissible flicker voltage versus frequency. In the other cases the flicker voltage limit is given with no reference to frequency of occurrence or with specific reference to one frequency.

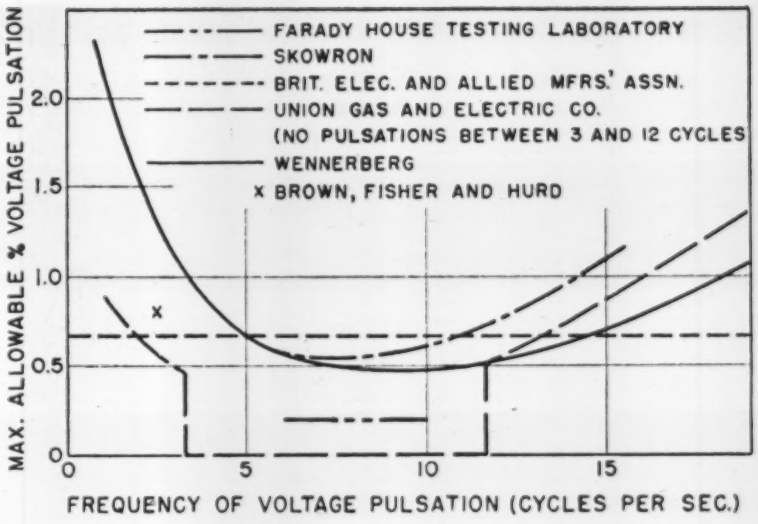

Fig. 1—Various recommended maximum allowable cyclic voltage variations

Company A expresses permissible flicker voltage in steps as follows: Three fluctuations per hour to 15 per minute, 1.7 per cent volts; 15 fluctuations per minute to 1 per second, 0.9 per cent volts; one fluctuation per second to 15 per second, 0.4 per cent volts.

Company B uses a tentative limit of 1½ per cent voltage with no reference to frequency of occurrence for arc furnace applications. On an actual installation, the per cent voltage fluctuation was approximately 0.5 per cent with a few fluctuations slightly higher. Their experience has been good and no complaints from light flicker have been received.

Company C uses a curve of permissible voltage fluctuations versus frequency of occurrence. At the lowest frequency of one fluctuation per second, the magnitude of the voltage change is 2.2 per cent. The voltage magnitude is a minimum of 0.5 per cent at a frequency of eight fluctuations per second. At the highest frequency of 20 fluctuations per second, the voltage limit is 0.7 per cent. These limits are termed as objectionable flicker voltage limits which should not be exceeded and refer to cyclic changes. These limits would be applicable to an arc furnace application.

Company D has established a limit of 0.7 to 1.0 per cent for a frequency of 15 fluctuations per minute for arc furnace applications. The thought is to design for a limit of 0.7 per cent with a maximum permissible variation of 1.0 per cent. In general, this company attempts to avoid situations causing voltage fluctuations greater than indicated by a curve which shows about 0.4 per cent voltage change at five fluctuations per second, 1.2 per cent at 15, and 1.5 per cent at one fluctuation per minute.

Company E uses limits applying to two groups of loads. Group I refers to small groups of people such as residences, small stores, etc. Group II refers to large groups of people such as office buildings, hotels, theatres, etc. Group I limits are 2/3 of the Group II limits, which are as follows: For frequencies of occurrence of fluctuations of one to four per second and 10 to 20 per second, the voltage limit is 1.5 volts; for frequencies of four to 10 per second the limit is 0.75-volt.

Company F uses a curve similar to that used by Company D except the minimum point is 0.5 per cent at five fluctuations per second.

The magnitude of the load swings determines the voltage fluctuations. The validity of the calculated results depends on the accuracy of the load changes assumed for the furnace. The available data do not tie down the value of the load change sufficiently accurate to eliminate all debate. Much basic data have been obtained on existing installations, but interpretation of these data is extremely difficult. Table I by B. M. Jones,[1] gives values of phase-to-phase load swings for various sizes of furnaces which occur with sufficient frequency to warrant consideration in evaluating flicker. Occasional swings of great magnitude can be expected. These data have been used to calculate voltage flicker.

Information on load swings for furnace transformer ratings high-

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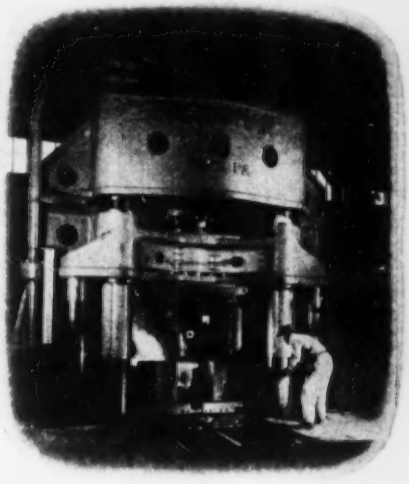

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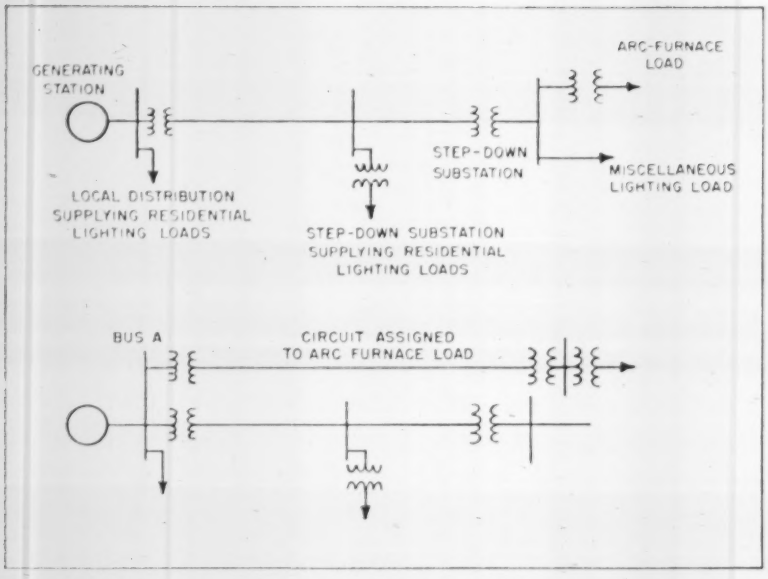

Fig. 2 (top)—Simple radial system for determining voltage flicker. Fig. 3 (bottom)—Basic change in supply system used to supply arc furnace load. The system elements are the same as those in Fig. 2, except where noted

er than those given is not known to the authors, but the data can probably be extrapolated with sufficient accuracy for calculations.

Calculation of Voltage Flicker—A simple radial system is illustrated in Fig. 2. It is desired to determine the voltage drop caused by the arc furnace load fluctuations. The maximum flicker voltage occurs when the power factor angle of the load change is the same as the impedance angle of the system. Because the incremental load change can have any power factor angle, it is safest to assume that it is the same as the system impedance angle. The maximum per cent voltage drop line-to-line occurs between the phases on which the load swing is present. The same per cent voltage drop appears as a line-to-neutral voltage on the secondary of a 30-degree phase shift transformation. The flicker voltage is determined by the load fluctuation and is independent of the steady-state furnace load. Therefore, calculations can be made based on incremental load changes only. These statements are readily verified by a symmetrical component analysis or by a Kirchoff law analysis of current and voltage provided the positive and negative sequence impedances of the circuits are equal.

The foregoing discussion provides a basis for a simplified procedure for determining the voltage drop caused by the arc furnace load fluctuation.

1. Determine the kva load swing and solve for the current,

$$I = \frac{\text{Kva Load Swing}}{E_{\text{Line to Line in Kv}}}$$

The voltage, $E_{\text{Line to Line in Kv}}$ may be assumed equal to 100 per cent.

2. Determine the per cent voltage drop

$$\frac{2IZ\,(100)}{E_{\text{Line to Line in Volts}}}$$

As previously stated, the per cent voltage drop thus obtained will be the maximum whether it is measured phase-to-phase or line-to-neutral, regardless of the number of transformations.

Conventional symmetrical components analysis will produce the same results as given in this procedure if the positive and negative sequence impedances are equal. A correct analysis requires the use of symmetrical components if generator transient reactance is used to determine flicker voltage because the positive and negative sequence impedances of the system are different. Unless synchronous equipment is close to the furnace, the positive and negative sequence impedances of the system will be equal. Thus the simplified procedure can be used in the majority of cases. Flicker voltage at points in the system which are closer to the source will be proportionately less.

The frequency of occurrence of the voltage fluctuations as calculated is not known. It is the authors' opinion that the voltage fluctuations may be assumed as having a frequency in the order of one to two per minute. A survey of the literature and the authors' experience indicate that this is a reasonable assumption. Using this frequency of occurrence, and referring to the examples of the limits established by several utilities, the conclusion can be drawn that a calculated flicker of about 1.5 to 2.0 per cent would be a satisfactory limit for arc furnace applications. Lacking an established industry standard, flicker limits for arc furnaces must be established by the individual utilities. These values are merely the authors' opinion.

Measures to Minimize Flicker—The radial system shown in Fig. 2 illustrates an arc furnace load supplied from an electrical system. Assuming that the flicker voltage limits are established and that the arc furnace rating is known, the method given in the foregoing section can be used to calculate the voltage flicker.

Flicker voltage must be determined on the bus which is closest to the furnace and from which a critical lighting load is supplied. If the voltage flicker is not acceptable, some corrective measure must be used.

Several corrective measures can be used, some of which are not feasible from a technical standpoint. Other methods might be feasible technically, but impractical economically. The usual methods applicable both technically and economically are supply circuit changes, series capacitors, and synchronous condensers usually in conjunction with buffer reactors.

1. Radial Line. A basic change in the supply system might be used to supply the arc furnace load as shown in Fig. 3. For this solution only the voltage fluctuations at bus A must be kept to acceptable limits. In this case as in the following cases, the voltage flicker can be calculated by the simplified method previously described, or more accurately by the method of symmetrical components.

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TABLE I

Single-phase load swings and power factors of the swings for various size furnaces*

Furnace Transformer N.P. Rating, kva	—Single-Phase Swing— Load Swing, kva	Power Factor, per cent
2000	2300	43
3000	3100	46
4000	3800	47
5000	4300	50
6000	5000	52
7500	5600	55
10,000	6500	60
12,000	7000	63.5
15,000	7750	68.5
16,000	8000	70

*In this table, single-phase load swing refers to phase-to-phase load swing as used in this paper.

2. Flicker Bus. In some instances a flicker bus has been provided to supply arc furnaces and other flicker producing loads. A flicker bus is usually a generating bus used to supply only flicker producing loads. This bus may be tied to an adjacent generating bus or to the system through impedance. The impedance accomplishes the purpose of a buffer reactor described later. The magnitude of this impedance is critical, and an analysis similar to the example given later should be made.

3. Series Capacitor. A series capacitor can be used to nullify the effect of series line reactance and thus decrease the voltage changes to the point in the system where voltage fluctuations must be minimized. This method has been used sucessfully on a few installations both small and large. Its success depends to a great extent upon the series resistance in the line. For example, on a line having a small conductor with a high ratio of resistance to reactance, nullifying the line reactance by the use of a series capacitor might reduce the light flicker only slightly. The real part of current in the load change times the line resistance could result in excessive flicker voltage.

Where there are several lines supplying the arc furnace load, its use will usually be precluded on the basis of economics because a series capacitor normally would be required in each line. A line on which there are many distributed loads is usually unsuitable for a series capacitor. A series capacitor for flicker correction must be applied between the source and the point at which flicker must be limited, because it reduces flicker only on its load side.

Use of a series capacitor fundamentally is not new. Its success has been brought about largely by the development of equipment to protect it under short-circuit conditions. There are problems other than protection and determination of rating associated with the application of a series capacitor. A shunting resistor is usually required around the series capacitor. The need for such a shunting resistor may come about because of ferroresonance, self-excitation of motors, and hunting of synchronous machines. Ferroresonance is the condition resulting when a transformer is excited through a series capacitor and transformer magnetizing inrush current continues to flow under steady-state conditions.

Self-excitation of the motors is the condition arising from the motor acting as an induction generator which supplies low frequency power to the system. The low frequency currents which may be present during starting will cause a negative torque and the motor may not come up to full speed. Synchronous machines tend to hunt especially at light load, when the supply system has a high ratio of resistance-to-reactance. The addition of the series capacitor might make a circuit have an abnormally high ratio of resistance-to-reactance because it nullifies some of the system reactance. These problems which come up in the application of a series capacitor should be considered and evaluated for each case.

Bibliography

'Electric Arc Furnace Flicker Can Be Overcome, by B. M. Jones, *Electrical World*, April 23, 1951, pp. 114-116, 189.

Conference paper presented at the general summer AIEE meeting, Minneapolis, June 26, 1952.

(The concluding installment will be presented in next week's issue.)

Welding Problem Not So Tough

When the Olsen Mfg. Co., Boise, Idaho, took on the job of fabricating 150 automotive trailers, the welding of two goosenecks on each trailer looked like a difficult fabrication problem. Weld could not be completed in one setup due to the size of the machine carriage.

A Unionmelt welding head, mounted on a radial arm support, and construction of a drive wheel track for an Oxweld CM-16 machine made the job easy. Linde Air Products Co. equipment and application assistance helped solve the problem.

CALENDAR
OF MEETINGS

March 2-6, American Society for Testing Materials: Spring meeting. Hotel Statler, Detroit. Society address: 1916 Race St., Philadelphia. Secretary: Robert J. Painter.

March 2-6, Pittsburgh Section, American Chemical Society and Spectroscopy Society of Pittsburgh: Pittsburgh conference on analytical chemistry and applied spectroscopy. Hotel William Penn, Pittsburgh. Information: L. E. Pitzer, U. S. Steel Co., 525 Wm. Penn Place, Pittsburgh 30.

March 3, Open Steel Flooring Institute: Annual meeting. Hotel Drake, Chicago. Institute address: 1506 First National Bank Bldg., Pittsburgh 6. Secretary: Stuart J. Swensson.

March 3-5, Society of Automotive Engineers: National passenger car, body and materials meeting. Hotel Sheraton-Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

March 4, Steel Kitchen Cabinet Manufacturers Association: Quarterly meeting. Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

March 6, Bituminous Coal Research Inc.: Annual meeting. Netherland Plaza hotel, Cincinnati. Institute address: 2600 First National Bank Bldg., Pittsburgh 22. Secretary: C. A. Reed.

March 8-11, American Institute of Chemical Engineers: Annual spring meeting. Hotel Buena Vista, Biloxi, Miss. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

March 11, Foundry Education Foundation: Annual meeting and technical, university & industry advisory committee conference. Hotel Cleveland, Cleveland. Foundation address: Terminal Tower, Cleveland 13. Executive director: George K. Dreher.

March 11-12, Society of the Plastics Industry Inc.: Annual Canadian conference. General Brock hotel, Niagara Falls, Canada. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

March 15-19, American Chemical Society: Spring meeting. Hotels Statler and Biltmore, Los Angeles. Society address: 1155—16th St. NW., Washington 6. Assistant secretary: R. M. Warren.

March 16-18, National Association of Waste Material Dealers: Annual meeting. Hotel Conrad Hilton, Chicago. Association address: 271 Madison Ave., New York 16.

March 16-20, National Association of Corrosion Engineers: Annual conference. Hotel Sherman, Chicago. Association address: 919 Milam Bldg., Houston 2. Secretary: A. B. Campbell.

March 16-20, National Association of Manufacturers: Institute on Industrial Relations. Hollywood Beach hotel, Hollywood-by-the-Sea, Fla. Association address: 14 W. 49th St., New York 20. Director, employee relations division: Sybil S. Patterson.

March 17-18, Steel Founders' Society of America: Annual meeting. Edgewater Beach hotel, Chicago. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

March 18-20, American Society of Tool Engineers: Annual meeting. Hotel Statler, Detroit. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

March 19-20, Porcelain Enamel Institute: West Coast conference. Hotel Statler, Los Angeles. Institute address: DuPont Circle Bldg., Washington. Secretary: John C. Oliver.

March 19-20, American Hot Dip Galvanizers Association Inc.: Annual meeting. Netherland Plaza hotel, Cincinnati. Association address: 1506 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart Swensson.

March 23-27, American Society for Metals: Western metals congress & exposition. Pan-Pacific Auditorium, Los Angeles. Information: 7619 Beverly Blvd., Los Angeles. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

MEN OF INDUSTRY

ELTON W. BRUNS
. . . Stamco chief engineer

RICHARD E. BLACK
. . . Stamco sales and service representative

MYRON L. KUCK
. . . Stamco chief draftsman

Stamco Inc. positions noted in STEEL Jan. 26 issue, page 62

(Continued from Page 78)

Minneapolis for **De Laval Steam Turbine Co.** The new district office is located in the Northwestern Bank Bldg. He formerly served with Detroit Stoker Co.

William S. Forrest was appointed assistant to the director of sales, **National Motor Bearing Co. Inc.**, Redwood City, Calif.

Robert P. Melius was named merchandise manager of **Skil Corp.**, Chicago, manufacturer of portable electric and pneumatic tools. He replaces **William Ferry,** appointed industrial sales manager. Mr. Melius formerly was with Delta Power Tool Division, Rockwell Mfg. Co., where he was vice president of sales. **Jack T. Carlsen,** industrial sales manager, was promoted to director of the newly formed sales training division.

F. Dier Tincknell was elected treasurer, **Chain Belt Co.**, Milwaukee. He succeeds **George M. Dyke.**

Paul R. Gross was named regional manager, treasury department, **United States Steel Corp.**, with offices in Chicago. He succeeds **John K. Banville,** named manager, treasury department, at Pittsburgh.

R. F. Doyle has resigned as executive vice president and general manager of **Duchess Co.**, Fairfield, Iowa, formerly Appliance Mfg. Co. **Dean L. Elliott,** secretary and treasurer, becomes works manager of the plant at Alliance, O. Mr. Doyle, prior to joining Appliance Mfg. Co. in 1950, was president of Alliance Mfg. Co.

Ray E. Greiner was appointed director of purchases for **Speer Carbon Co.,** St. Marys, Pa., and its divisions. Mr. Greiner has been with Speer for ten years and purchasing agent for International Graphite & Electrode Division.

C. H. Brechin was appointed manager of **Westinghouse Electric Corp.'s** porcelain department, Derry, Pa. He replaces the late W. F. Bailey. Mr. Brechin formerly was manager of manufacturing at the porcelain department plant.

Officers were announced for **Metal Briquettes Inc.**, Granville, Wis., a newly formed company to process machine shop scrap for use in foundries. **T. N. Moore Sr.** is president, **T. N. Moore Jr.** vice president, **G. Milton Ehlers** treasurer, and **T. H. Spence** secretary.

F. J. Stokes Machine Co. appointed **L. E. Ritter** sales engineer in charge of its new St. Louis office. He joins the company after serving with A. Y. McDonald Co.

Ross A. DeMatteo II, salesman in the Washington district sales office, was transferred to the New York office of **Anaconda Wire & Cable Co. James P. Ruch,** salesman in the Kansas City office, transfers to the Detroit office. **Bruce Van Wagner** rejoins the Anaconda sales organization, assigned to the New York district office.

Cecil J. Mader, vice president, **Tri-Clover Machine Co.,** Kenosha, Wis., was made a director.

Robert C. Case, technical superintendent of the Gadsden, Ala., plant of **Goodyear Tire & Rubber Co.,** returned to Akron to assume new duties as chief engineer of the tire design division. **M. H. Laatsch,** chief chemist at Gadsden, replaces Mr. Case there, and **J. L. Ryan** succeeds Mr. Laatsch.

S. L. Jackson was appointed district manager of the Los Angeles office, and **R. L. Reed** as district manager of the Detroit office of **Electro Metallurgical Co.,** a division of Union Carbide & Carbon Corp.

Trayer Products Inc., Elmira, N. Y., elected **Harold E. Townsend** president to succeed the late Charles H. Sayre. Mr. Townsend has been chief engineer since 1946.

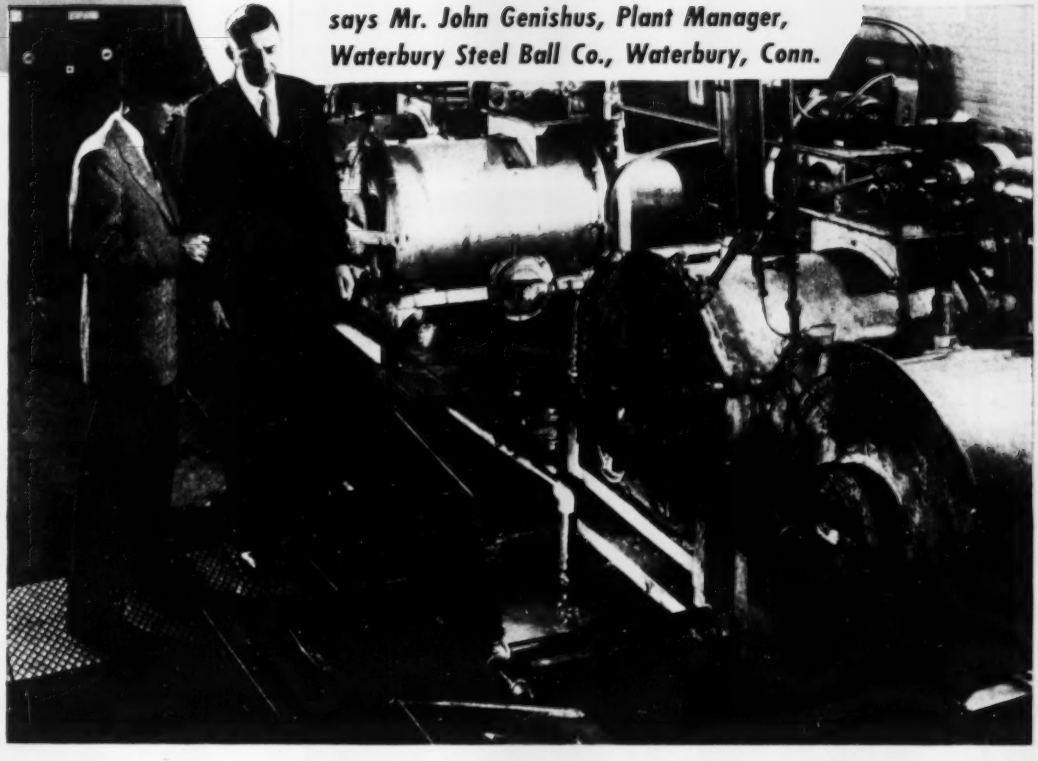
James S. Walker was named manager of technical service, **Hooker Electrochemical Co.,** Niagara Falls, N. Y.

Foundry Supplies Division, **Frederick B. Stevens Inc.,** Detroit, appointed **Paul E. Williams,** Elkhart, Ind., as sales representative oper-

"with **GULF SUPER-QUENCH**

Rockwell C-65 is a sure thing on SAE 52100 steel balls,"

says Mr. John Genishus, Plant Manager, Waterbury Steel Ball Co., Waterbury, Conn.



"In our experience, there's nothing like Gulf Super-Quench for quenching steel balls for anti-friction bearings," says Mr. Genishus. "These parts require a uniform as-quenched hardness of at least Rockwell C-65 all the way through. Then we temper to Rockwell C-62. Metallographic examinations show we're getting a fine grain structure with Gulf Super-Quench and one which is very homogeneous. We feel that a goodly share of our success in this operation can be attributed to this fast quenching oil."

No matter what alloy steels or shapes you quench, you will gain from the greater quenching power of Gulf Super-Quench. For further details on this outstanding quenching oil, contact your nearest Gulf office.

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Technical Service Data Sheet
Subject: RUST PROOFING WITH PERMADINE®

Steel parts that have been Permadized and then "sealed" with a rust-preventive oil such as "Granoleum" are effectively protected from rust. And, if the oiled "Permadine" coating should be damaged, rusting will not spread beyond the area of exposure.

Note: Automotive and other rubbing parts subject to friction are usually given "Thermoil-Granodine" manganese-iron phosphate coatings for both wear-resistance and protection from corrosion.

DATA ON THE "PERMADINE" COATING

Type of coating	Zinc phosphate
Object of coating	Rust and corrosion prevention
Typical products treated	Nuts, bolts, screws, hardware items, tools, guns, cartridge clips, fire control instruments, metallic belt links, steel aircraft parts, certain steel projectiles and many other components
Government Specifications	U.S.A. 57-0-2C, Type II, Class B MIL-C-16232, Type II U.S.A. 51-70-1, Finish 22.02, Class B AN-F-20 Navy Aeronautical M-364 IAN-L-548
Scale of production	Large or small volume. Large or small work
Method of application	Dip Barrel tumbling, racked or basketed work
Equipment notes	Immersion tanks of suitable capacity. Cleaning and rinsing stages can be of mild steel. Coating stage can be of heavy mild steel or stainless steel
Chemicals required	"Permadine" No. 1
Pre-cleaning methods	Any common degreasing method can be used. Alkali cleaning "Ridosol", Acid cleaning "Deoxidine", Emulsion alkali cleaning "Ridosol", "Ridofire", vapor degreasing, solvent wiping, etc., are examples. Acid cleaning may need to follow other cleaning methods if rust or scale is present
Bath Temperature	190° - 205° F.
Coating time	20 - 40 minutes
Coating weight range	1000 - 4000 mgs. per sq. ft.
Technical Service Data Sheets	No. 7-20-1-2 I.M. No. 5

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "PERMADINE" AND YOUR OWN METAL PROTECTION PROBLEMS

CHEMICALS ACP PROCESSES

JOHN W. GOSSELIN
. . . asst. to president of Phoenix Mfg.

ating from the Indianapolis branch. **Renard Brown** is representative in southern New York and northeastern Pennsylvania, operating from Buffalo.

Phoenix Mfg. Co., Joliet, Ill., appointed **John W. Gosselin** as assistant to the president. He has been connected with the company's operating and sales divisions since 1949.

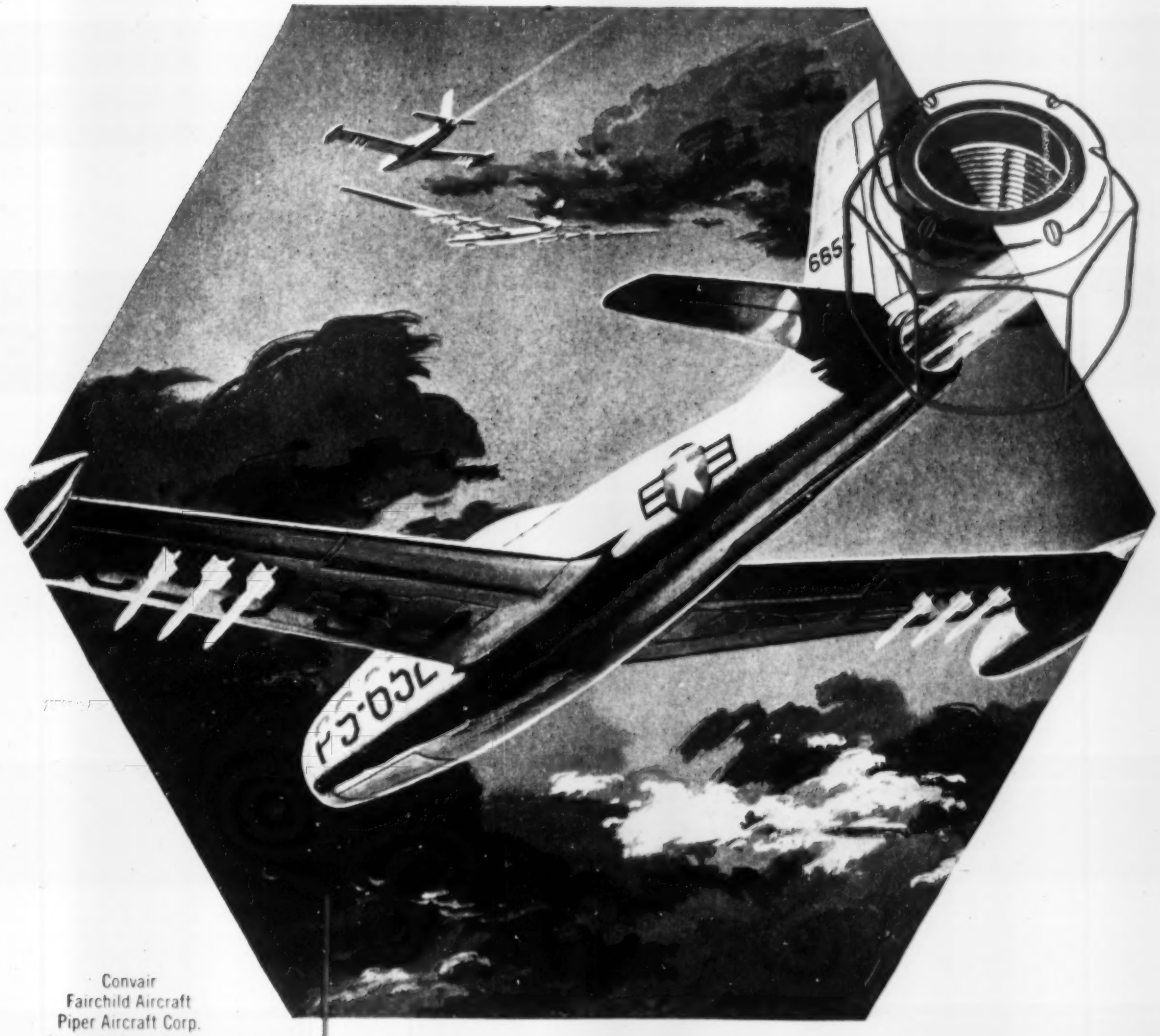
Lewis E. Pilsbury was named resident manager of the recently opened district sales offices of **Phelps Dodge Copper Products** at 2408 N. Farwell Ave., Milwaukee. He formerly was with Chase Brass & Copper Co.

C. L. Horner was appointed supervisor of systems and procedures for **Chrysler Corp.**, Detroit. He joined the company in 1952 on the staff of the vice president and general manager, and for the last seven months has been engaged in special studies of systems and procedures.

Election of former **Secretary of Commerce Charles Sawyer** as a director of **Kennecott Copper Corp.**, New York, was announced by the company.

Robert L. Pierce was appointed assistant sales manager of the Pittsburgh district, **Jones & Laughlin Steel Corp.** He has been a salesman in the St. Louis district office since 1951.

G. M. Giannini & Co. Inc., Pasa-



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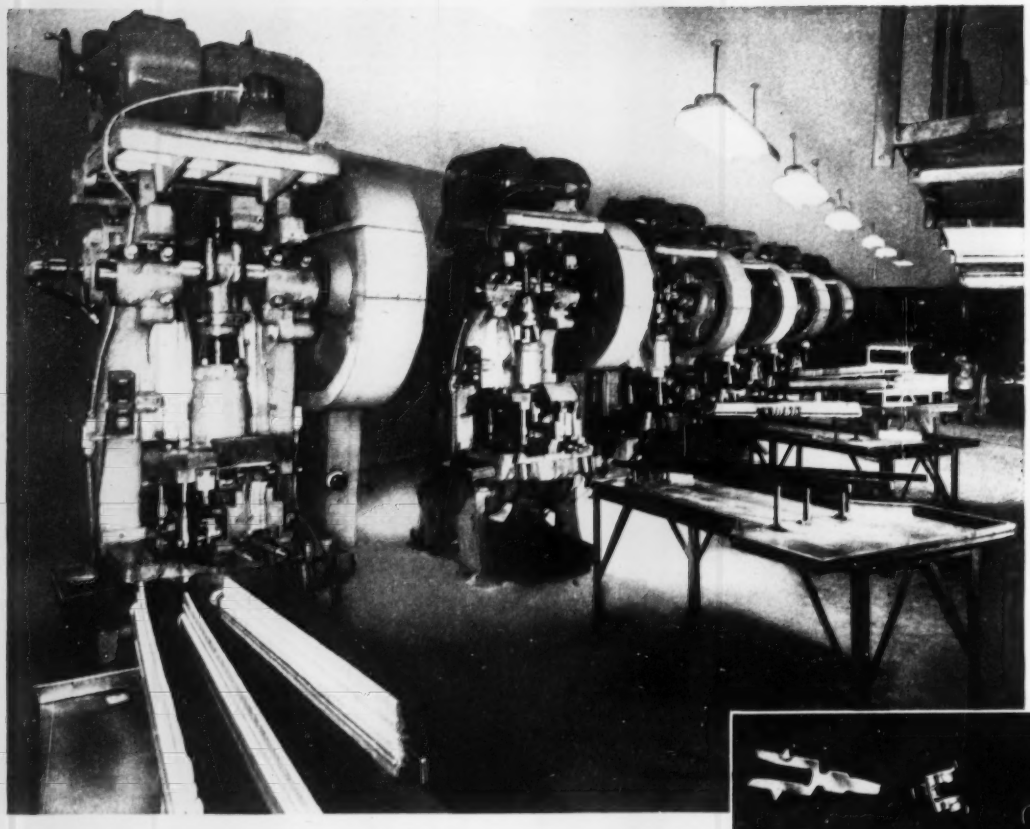

The flat stamped parts are magazine fed to the Inclinables for the final operation in forming these cartridge clips.

L. A. Young Spring & Wire of Detroit depends on FERRACUTE INCLINABLES for high-speed production of cartridge clips

This battery of Ferracute CG 16½ Inclinable Presses is an important part of the high-production operations of the L. A. Young Spring and Wire Corporation in Detroit. These presses are of 88 tons capacity, operated by combination air friction clutches and driven by variable speed units. Ferracute Inclinables are available in a complete range of sizes from 6 to 200 tons. Your inquiries concerning specific applications are invited.

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Since 1863

FERRACUTE MACHINE COMPANY

Manufacturers of Power Presses and Special Machinery **Bridgeton, New Jersey, U. S. A.**

JAMES W. BIRKENSTOCK
. . . new post at Inter'l. Business Machines

dena, Calif., appointed **Edward H. Hughes** director of industrial relations.

International Business Machines Corp., New York, promoted **James W. Birkenstock** to director of product planning and market analysis. In his new post he will be responsible for product development in the company's electric accounting machine, electric typewriter and time recording divisions and the special products division. He previously was executive assistant at the company's World Headquarters.

Tenney Engineering Inc., Newark, N. J., appointed **Fred L. A. Schmidt** as a senior engineer in the environmental test chamber division.

Allegheny Ludlum Steel Corp., Pittsburgh, appointed **Ralph L. Harding Jr.** market research analyst and **Edmund C. Tynan** to its stainless tubing sales division.

Arthur F. Gerada is sales engineer on the **Udylite Corp.** Cleveland district sales staff. He will serve customers in the Cincinnati area.

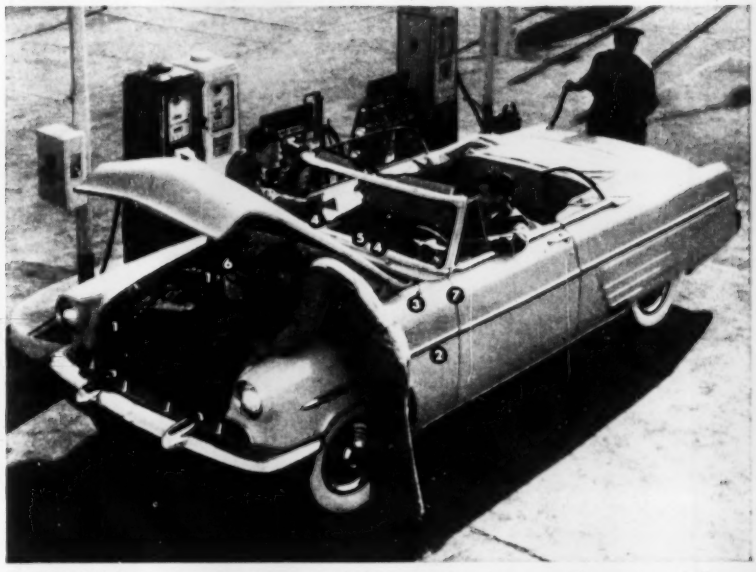
Norman E. Cook was elected vice president-manufacturing, and **John L. Cotter** treasurer of **Sterling Engine Co.**, Buffalo.

E. H. Gustafson was named Chicago branch manager and **Irl Snell** Chicago retail sales manager for White Motor Co.

Engineering & Research Corp.,

(*Please turn to Page* 120)

METALS



WE EXPECT the motor to roar when we push the starter, the wipers to swish away rain, the heater to pour out warmth. Berylco parts make this possible. For parts and key numbers, see below.

STRENGTH PLUS CONDUCTIVITY

Beryllium copper supplies the automotive industry with reliable low-cost answers

The element beryllium was an 18th century discovery which didn't amount to a tinker's dam until it was alloyed with copper in the 1930s. The result: miraculous. The new alloy retained the good conductivity and corrosion resistance of copper, with the strength and hardness of many steels.

Alert car manufacturers, always on the lookout for reliable materials which will give long life and eliminate costly breakdowns, were among the first to use Berylco beryllium copper. It now appears in many small—but essential—parts of your car. Engineers know these parts will function perfectly for millions of cycles without relaxation or loss of strength or conductivity.

The outlook for expanded use of beryllium copper is extremely favorable. Increased supplies of beryl ore and domestic mining activities will undoubtedly mean (1) the development of new alloys and (2) a substantial addition to the thousands of applications now in use. Manufacturers who would like to take advantage of this versatile alloy are invited to share the experience and know-how of the world's largest producer. For information, write THE BERYLLIUM CORPORATION, Dept. 3B, Reading 19, Pa.

Tomorrow's products are planned today —with Berylco beryllium copper

Shown here are the Berylco parts numbered in the 1953 car above—a few of the many which help deliver top performance. Reading across, they are (1) wire clips; (2) dimmer switch terminals; (3) antenna raiser; (4) windshield wiper springs; (5) cigar lighter contact; (6) heater control; (7) door switch spring.

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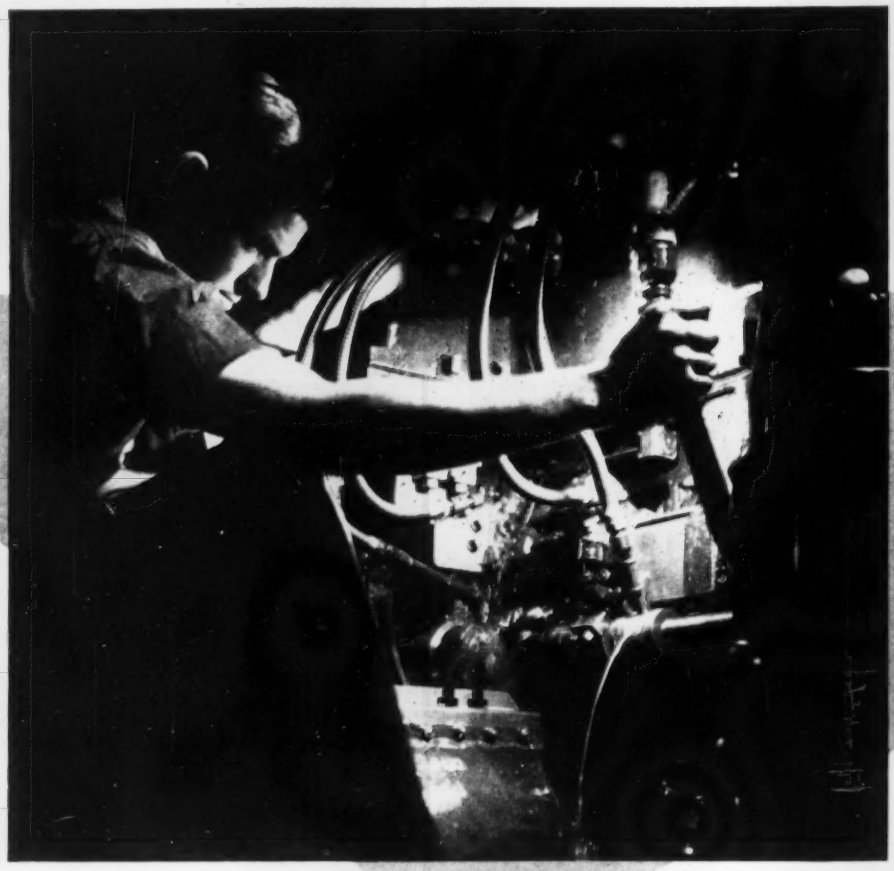
Here, in the tool zone, is where the superior machinability of Union Drawn Steels pays profits.



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filled with how-to-do-it information and data to help you use Republic Unioa Cold Drawn Steels. Write for "Union Drawn Pocket Library."

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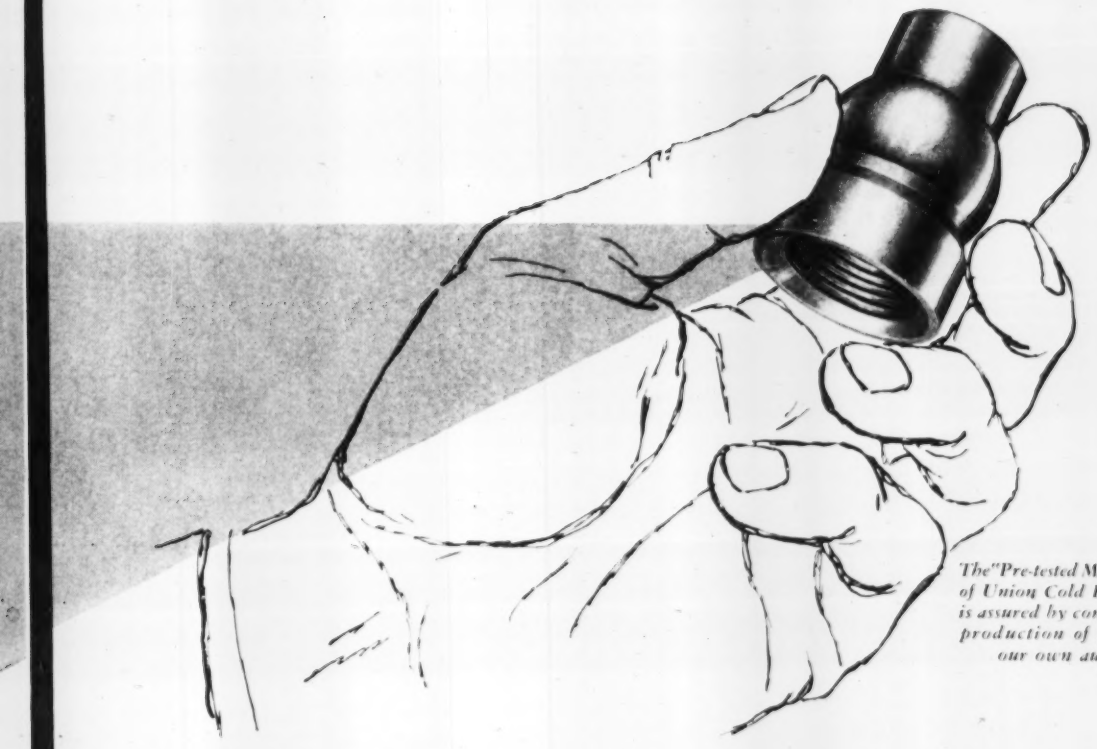

The "Pre-tested Machinability" of Union Cold Drawn Steels is assured by continuous test-production of this part on our own automatic.

Your set-up men and automatics can get into production sooner, with fewer headaches, because our automatic screw machine shop at Massillon, Ohio, is the world's largest producer of a completely useless part . . . shown above.

Day-after-day, a modern automatic turns out only this part. It embodies the 6 most common "automatic" operations . . . it tells us how our Republic Union Cold Drawn Steels will behave in *your* shop, on *your* machines. It also tells us how to make Union Drawn Steels even better for automatics . . . even *more* free-machining . . . even *more* profitable for you.

In *your* shop, our Republic Field Metallurgists can help you use the things we have learned in *our* shop . . . better set-ups, heavier feeds and faster speeds, most efficient tool angles . . . all the knowledge to help you make the most of Union Drawn *machinability* on your job schedule and your profit sheet.

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TOUGHNESS • HARDNESS • STRENGTH

WHELCO M

OIL HARDENING TOOL STEEL

WL offers *"Whelco"* M – a tool steel of maximum toughness, hardness and strength – a steel to assure maximum results at low cost! *"Whelco"* combines great penetration of hardness, great toughness at high hardness, wide hardening range, fine grain structure, and desirable non-deforming characteristics. *"Whelco"* has good forging properties and is readily machinable in the annealed condition. All **WL** warehouses stock *"Whelco"* M tool steel in a wide variety of flats and squares. Call your nearest **WL** man for a trial order – the results will speak for themselves!

***WL** steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hardenability – thus eliminating costly changes in heat treating specifications.*

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS

ROBERT B. TAGGART
. . . New York Air Brake div. engineer

Riverdale, Md., appointed **Wendell S. Walker** engineering office manager.

Robert B. Taggart, executive engineer of Watson Flagg Machine Co., Paterson, N. J., joins **New York Air Brake Co.'s** Watertown Division as chief industrial engineer.

Arthur H. Kapnick was made manager of the Adrian, Mich., plant of **American Chain & Cable Co. Inc.**

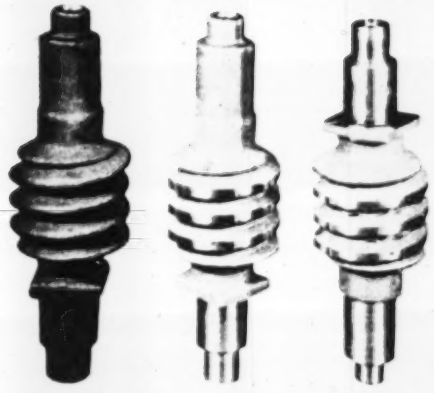
E. C. Jacoby was made manager of the contract administration department at **Weber Aircraft Corp.**, Burbank, Calif.

Newly elected directors of **Firth Sterling Inc.**, Pittsburgh, are **J. Fred Hedding** and **Harold E. Sweeney.**

G. S. Kariotis was appointed sales manager of the southern California branch office of **Sprague Electric Co.**, Culver City, Calif. He succeeds **Thomas S. Bills**, resigned.

F. H. Webster was appointed manager, Chicago western division sales office, for **Hyatt Bearings Division**, General Motors Corp. He succeeds **C. L. Newby**, retired.

Leo J. Rohrer was appointed manager of the order and scheduling department of **Crucible Steel Co. of America**, Pittsburgh. He was formerly assistant manager of that department, and succeeds **Harvey R. Moll** who now serves Crucible as a special consultant to the depart-



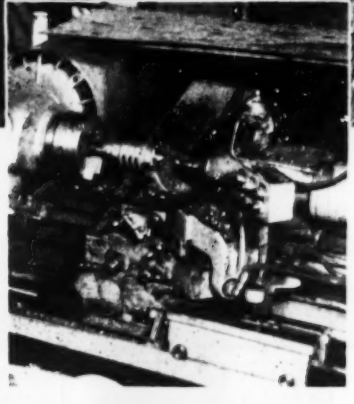
THIS EARLY BIRD GETS THREE TIMES THE WORMS!

That's the Mona-Matic for you!

"THREE TIMES THE OUTPUT!", says Gar Wood Industries, Inc., of their new Mona-Matic installation. Output has increased, on turning these worm shafts, from 2 pieces formerly put on the floor every 14 minutes, 45 seconds to 2 pieces every 4 minutes, 9 seconds —one man operating two machines in each case. That's more than a 255% production increase for the Mona-Matics!

There's a great performance story here, too. Only a machine built like the Mona-Matic can deliver satisfactory finish and good tool life while maintaining required limits on the intermittent cut over the forged worm threads. The 2-speed motor on Machine #1 easily accommodates the turning of diameters as varied as those of worm threads and shaft end. Excessive stock removal from small end diameter is accomplished by dual template control on Machine #2. With two tools on rear slide of each machine, one faces the end of the shaft while one rough faces a shoulder and forms an undercut.

Here's a machine that can boost output and cut costs on long runs and short ones. Why not find out —right now— what it can do for you? Write for Booklet 1805 containing full information, data, job reports. It's new! . . . *The Monarch Machine Tool Company, Sidney, Ohio.*



Part—Worm Shaft. **Material**—SAE 8640 forging. **Operation**—turn complete for grind using carbide tools. Limits ± .001". **Comment**—with one operator for two machines in each case, output has soared from 2 pieces every 14 minutes, 45 seconds to 2 pieces every 4 minutes, 9 seconds—a 72% reduction in machining!

Monarch

ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

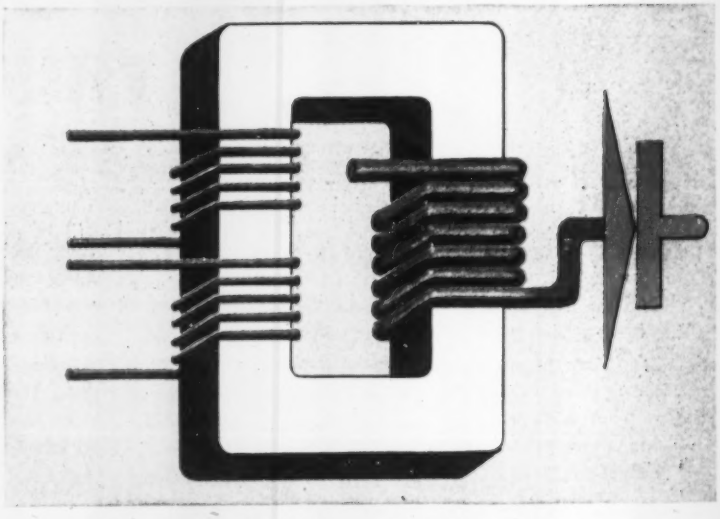
CLARK *Magnetic Amplifier*

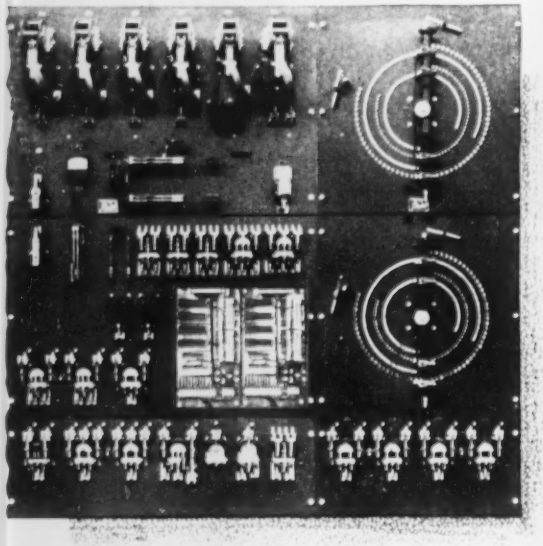
for MILL USE

The CLARK Magnetic Amplifier is particularly adapted for heavy duty mill applications.

Built like a transformer—with no moving parts and no valves, it is unaffected by shock and vibration. It requires no warm-up period, and practically no maintenance. It is rugged and reliable, and does not get out of adjustment.

Its ability to amplify a small signal current makes it ideal for service in voltage regulation, speed control, positioning, tension control and accelerating applications.





The picture shows CLARK Magnetic Amplifiers applied to Motor Operated Rheostats. No contacts are required in the motor circuit to reverse rotation. Pre-selected positions on the rheostats are provided by Push Button and Potentiometer remote control, or combinations of any desired number.

Within a range of 5 to 20 seconds, any selected rate of travel in either direction is available. There is continuous adjustment of position, and the speed of response prevents hunting or overshooting. Accuracy is maintained within one button on the Motor Operated Rheostat.

The power requirement is very low.

Greater production, finer performance and more uniform operation in a broad variety of applications in Steel Mills and other industrial plants result from the use of CLARK MAGNETIC AMPLIFIERS.

Consult CLARK *for information regarding practical use of Magnetic Amplifiers in your electrical control operations.*

ENGINEERED ELECTRICAL CONTROL

THE CLARK CONTROLLER CO.

1146 EAST 152ND STREET, CLEVELAND 10, OHIO

BRUCE W. GLENN
. . . L. R. Kerns V. P.-sales

ment and on special projects for sales and operating departments.

L. R. Kerns Co., Chicago, appointed **Bruce W. Glenn** vice president in charge of sales.

Horizons Inc., Princeton, N. J., announces that **Dr. James L. Wyatt** joined its scientific staff in Cleveland as assistant to the technical manager.

Atlas Mineral Products Co., Mertztown, Pa., announces that **Frederick H. Perfect** joined its research department to specialize in coatings, linings and adhesives. **Edward W. Ziminsky**, formerly of General Motors Corp., also joins the company, assigned to the study of special plant problems.

Vacu-Blast Co. Inc., San Mateo, Calif., appointed **Alexander Gabay** as works manager of its new works in Belmont, Calif. For the last year and a half he has been with Wooldridge Mfg. Co. as works manager and assistant to the president.

O. B. Wilson was named industrial instruments sales manager, industrial division, **Minneapolis-Honeywell Regulator Co.**, Philadelphia, a newly created post. In 1948 he was made industrial manager for the eastern sales region, and early last year became field sales manager, industrial division.

Taft-Peirce Mfg. Co., Woonsocket, R. I., appointed **Jesse E. Deacon** assistant superintendent of the

(*Please turn to Page* 126)

Threaded Specialties
to Class 3 Fit

For years Pawtucket has specialized in specialties — of any size, in any metal, to any specifications.

Two items have become widely used because of their lower cost, more accurate fit and greater-than-needed strength. Pawtucket's eye bolts and tee-head bolts are made by an exclusive process that guarantees all these advantages.

For these and any other threaded specialties, save by seeing Pawtucket — "The Bolt Man".

BETTER BOLTS SINCE 1882

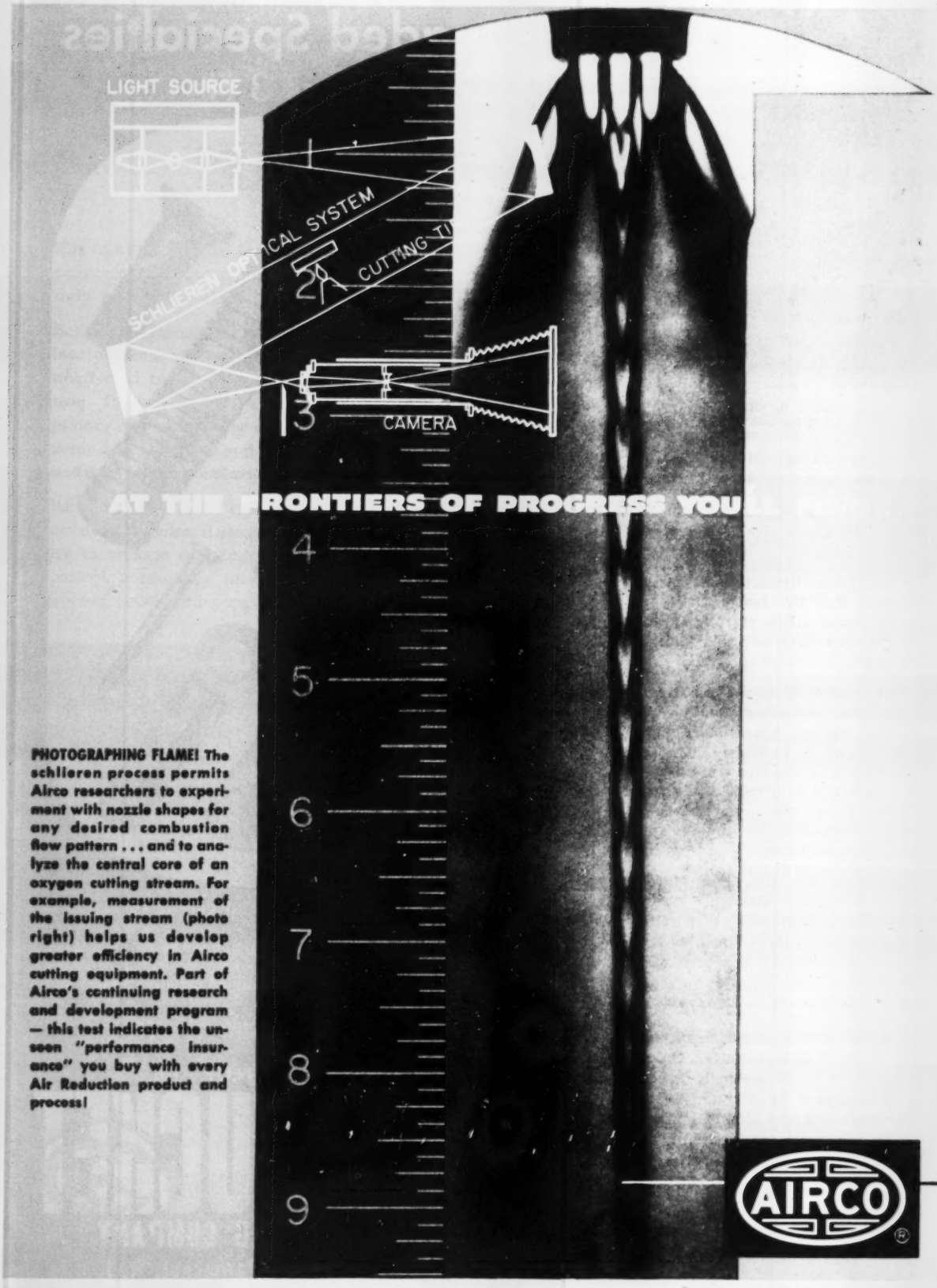
"THE BOLT MAN"

T.M. REG.

PAWTUCKET
MANUFACTURING COMPANY

327 Pine Street · Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS



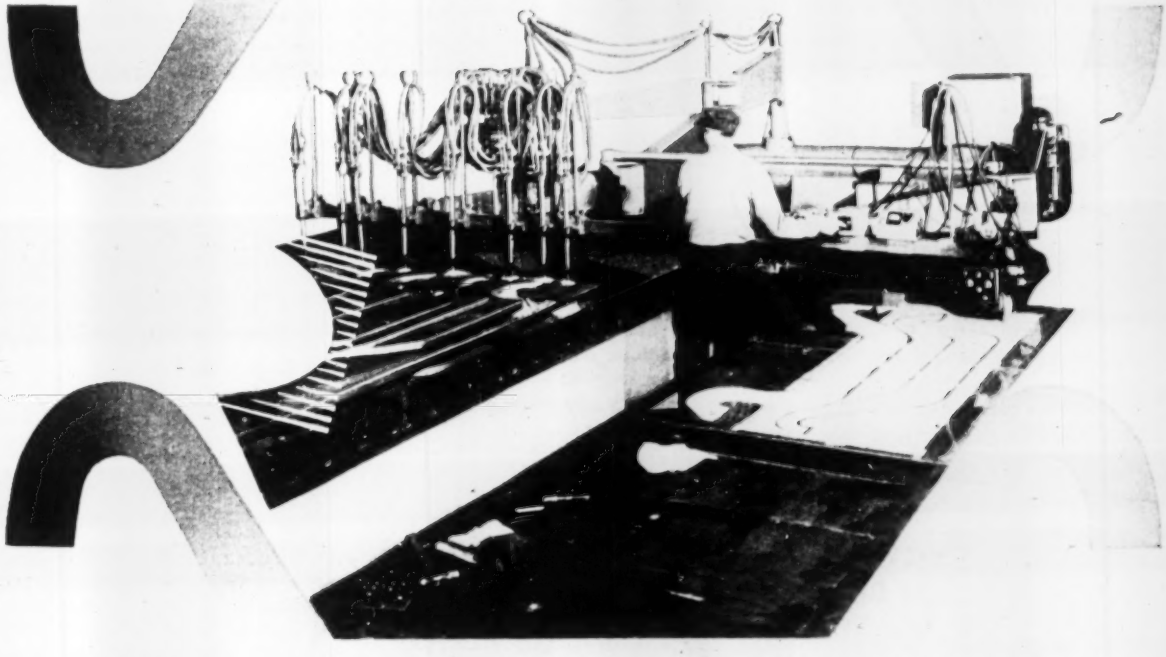
AT THE FRONTIERS OF PROGRESS YOU

PHOTOGRAPHING FLAME! The schlieren process permits Airco researchers to experiment with nozzle shapes for any desired combustion flow pattern . . . and to analyze the central core of an oxygen cutting stream. For example, measurement of the issuing stream (photo right) helps us develop greater efficiency in Airco cutting equipment. Part of Airco's continuing research and development program — this test indicates the unseen "performance insurance" you buy with every Air Reduction product and process!

AIRCO®

OXYGEN • ACETYLENE • INDUSTRIAL AND RARE GASES • CALCIUM CARBIDE • WELDING SUPPLIES AND ACCESSORIES

YOKES FOR AN IRON HORSE...



THE AIRCO NO. 50 TRAVOGRAPH mass produces yoke-shaped equalizer bars for locomotives . . . to a 1/16" tolerance! Torches are automatically guided by an electronic tracer following a low-cost, pen-and ink drawing . . . as four bars are cut simultaneously from 1½" mild steel, hot rolled plate. The versatile Travograph may be used for straight cutting, beveling or squaring . . . for circles up to 12 feet in diameter . . . or for straight lines of any desired length by adding extra sections of rail. Intricate shapes . . . cut to specification . . . with precision!

And remember, when you need oxygen, acetylene, other industrial or rare gases, think of Air Reduction. A nation-wide distribution system is ready to supply your needs.

AIR REDUCTION

DEALERS AND OFFICES IN MANY PRINCIPAL CITIES

60 East 42nd Street • New York 17, N. Y.

Air Reduction Sales Co. • Air Reduction Magnolia Co. • Air Reduction Pacific Co.

Represented Internationally by Airco Company International

Divisions of Air Reduction Company, Incorporated

• OXYACETYLENE WELDING AND CUTTING APPARATUS • ARC WELDING AND INERT-GAS ARC WELDING EQUIPMENT

RAYMOND F. STANLEY
. . . joins National Motor Bearing

J. B. ELLOR
. . . Lamson sales promotion mgr.

contract division. He is replaced as foreman of the propeller shaft department by **Russell W. Grabinsky.**

Raymond F. Stanley joined **National Motor Bearing Co. Inc.**, Redwood City, Calif., as chief industrial engineer.

J. B. Ellor was appointed sales promotion manager, **Lamson Corp.**, Syracuse, N. Y. He formerly held the position of market research manager. In his new position, Mr. Ellor will continue to direct the market research activity in addition to supervising Lamson's over-all sales promotion and advertising.

"New Process"
Punches • Dies • Rivet Sets
Compression Riveter Dies
Made of highest standards and uniform quality thus insuring maximum service.
Since 1903
Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.
Write Dept. A for Catalog 46
1903 1953
GEO. F. MARCHANT COMPANY
1420-34 So. ROCKWELL STREET • CHICAGO 8, ILLINOIS

Jack O. Coffey was named aircraft sales manager of the South Wind Division, **Stewart-Warner Corp.**, Indianapolis. He has been serving as sales engineer since 1948, and now fills the vacancy created by promotion of **W. V. Ryan** to general sales manager.

Morris Evans was appointed to the Houston regional office of **Cooper-Bessemer Corp.**

Harold J. Buzick joined **Porter Muffler Mfg. Co. Inc.**, Los Angeles, as sales manager.

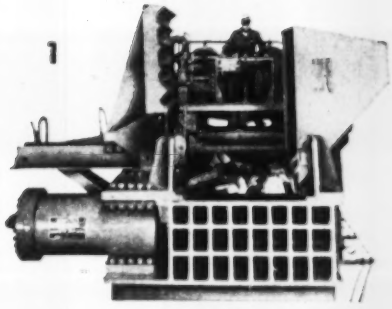
Cambridge Corp., with home plant in Somerville, Mass., and with operations in Syracuse, N. Y., and Denver and Boulder, Colo., made the following organization changes: **Roger S. Warner Jr.**, vice president of the mechanical division, was named to the board of directors along with **David H. Northrup**, vice president of the filter division, and **Helge Holst**, secretary of the corporation and a staff member of Arthur D. Little Inc. **William R. Morgan** was elected vice president of manufacturing with headquarters in Somerville, and **George A. Brooks** becomes treasurer.

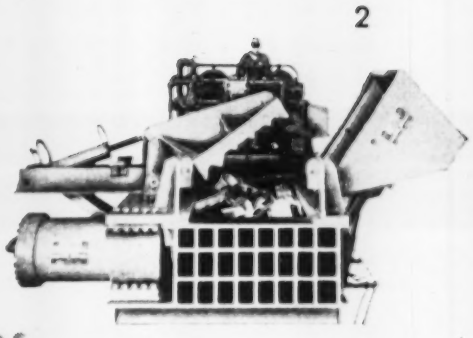
Watson-Standard Co., Pittsburgh, appointed **Charles H. Groff** technical director of the company. He formerly held the same position with Surface Chemicals Inc. and returns to Watson-Standard where he was assistant technical director from 1943 to 1946.

Dr. Brian O'Brien was appointed vice president in charge of research, **American Optical Co.**, Southbridge, Mass. He has taken a leave of absence as director of the Institute of Optics and as research professor of physics and optics at the University of Rochester.

Marion Power Shovel Co., Marion, O., appointed two sales representatives. **William B. McCausland** was named to the district office in New York, and **E. Edward Staker** will be in the northwestern Ohio territory with headquarters at the Marion offices.

J. Harold Becker was appointed general traffic manager, **Chrysler Corp.**, Detroit, and **Howard J. Connelly** becomes traffic manager. **Lamar R. Grim** was named traffic supervisor, Plymouth Division.

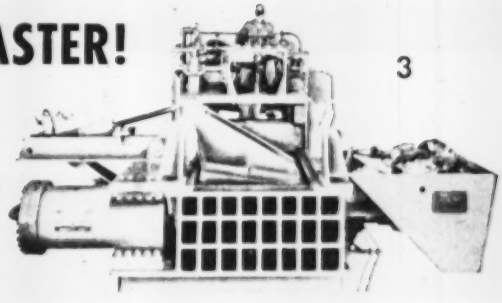




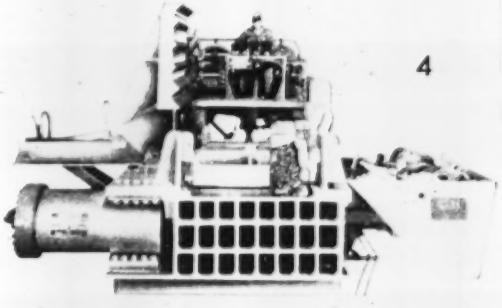
THE DEMPSTER-BALESTER

1-2-3-4 Hydraulic Operation

BALES YOUR SCRAP METAL FASTER!



The key to low cost scrap metal baling is fast, consistent baling. The big capacity *Model "600" Dempster-Balester* high speed press pictured here will bale your scrap as fast as your crane can feed it! This tremendous baling speed is due to the Dempster-Balester's 1-2-3-4 hydraulic cycle. 1—Skip Pan Loader loads charging box (see Photo 1). 2—Skip Pan returns to loading position as Auxiliary Compression Door compresses scrap with a 15-ton force. (see Photos 2 and 3). 3—Charging box door is closed and scrap is baled, then 4—finished bale, weighing between 600 and 1,000 pounds, is ejected. (see Photo 4). Without question, *Dempster-Balesters* are the fastest, most efficient presses baling scrap! For complete information clip coupon below and mail to us today. A product of Dempster Brothers, Inc.



DEMPSTER BALESTER

CHECK BELOW INFORMATION DESIRED

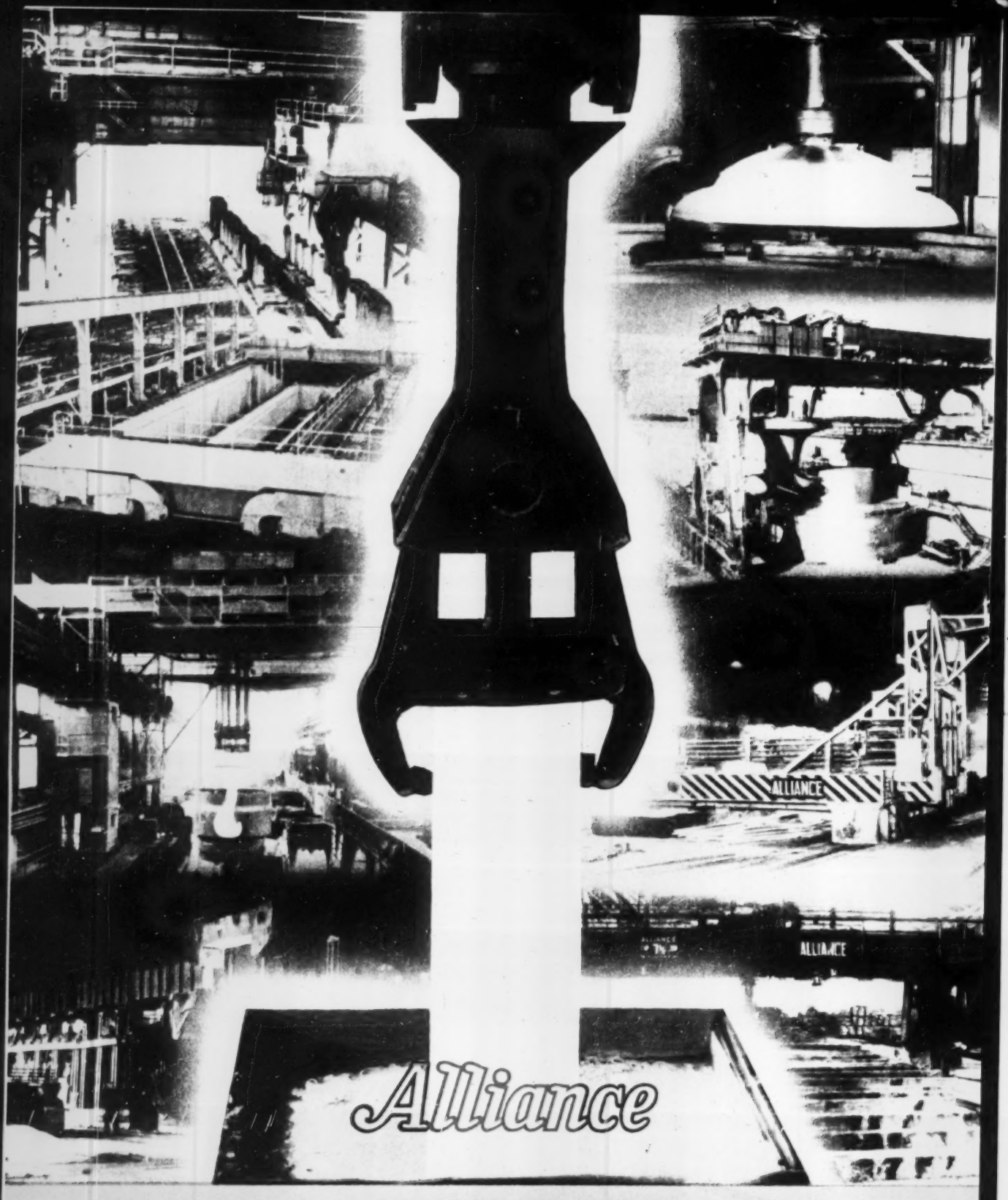
- ☐ Dempster-Balester Model "600". Produces 600 to 1000 lb. bales.
- ☐ Dempster-Balester Model "350" (High Speed). Produces 300 to 400 lb. bales.
- ☐ Dempster-Balester Model "275". Produces 300 to 400 lb. bales.
- ☐ Dempster-Balester Model "125" (Portable). Produces 175 lb. bales.

NAME

FIRM

ADDRESS

DEMPSTER BROTHERS, 623 Dempster Bldg., Knoxville 17, Tennessee



THE ALLIANCE MACHINE COMPANY

MAIN OFFICE
ALLIANCE, OHIO · PITTSBURGH OFFICE
1622 OLIVER BUILDING, PITTSBURGH, PA.

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION

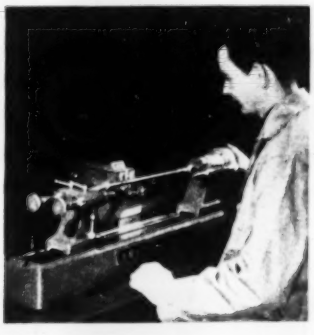
NEW PRODUCTS and equipment

Reply cards on page 143 will bring you more information on any new products and equipment in this issue

Lead Measuring Instrument

. . . checks 8-inch diameter parts

Universal lead measuring instrument determines accurately the lead of internal and external threads on work parts up to 8 inches diameter and 18 inches long. The headstock, in addition to mounting the centers, carries what



is virtually the barrel of a specifically constructed micrometer. Tailstock can be used in either of the two runways to accommodate work of various diameters, and can be locked in any position.

Machine can be supplied with an attachment for measuring lead of taper threads up to and including taper of one in four on the diameter. Sheffield Corp., Dept. ST, Dayton 1, O.

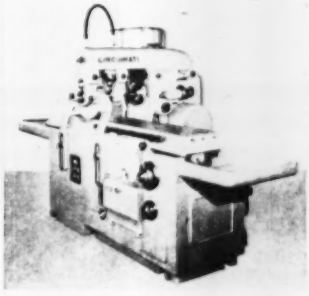
USE REPLY CARD—CIRCLE No. 1

Milling Machine Line

. . . automatic or manual control

Line of automatic milling machines is offered in plain, duplex and plain rise-and-fall styles. Each is powered at the spindle by 3 or 5-hp motors. Standard table travel is 24 inches, although longer table travel up to 144 inches is available for long and comparatively light work. Through a cycle selector unit, a single lever initiates the complete milling operation. To aid in setting up the machine, all automatic features can be nullified or bypassed for manual control.

Bed walls are considerably wider than the table. Intervening



space serves to catch coolant and chips and direct them to a chip compartment in the right-hand end of the bed. Table ways are automatically pressure lubricated with filtered oil and completely protected against dirt, chips and coolant. Twenty spindle speeds range from 30 to 1200 rpm. Cincinnati Milling Machine Co., Dept. ST, Cincinnati 9, O.

USE REPLY CARD—CIRCLE No. 2

Truck, Trailer Wheel Block

. . . positive, safe holding

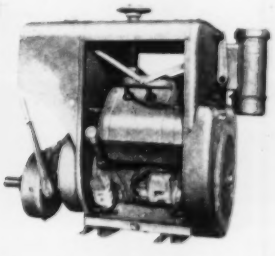
This heavy-duty truck and trailer wheel block is made of high-strength cast alloy steel and provides positive, safe holding under any condition of grade, surface and load. Block can be nailed to freight car or truck floors, shipping platforms, etc., to insure blocking of heavy equipment during shipment. Block has a wide, curved tread plate, without sharp corners or projecting surfaces. Steel gripper teeth on the bottom plate keep the block from creeping or slipping. Calumet Steel Castings Corp., Dept. ST, 1636 Summer St., Hammond, Ind.

USE REPLY CARD—CIRCLE No. 3

Engine Line Addition

. . . operates in 25-36hp range

Heavy-duty air-cooled engine line is expanded by addition of the model VG4D 4-cycle V-type 4-cylinder engine. The model develops a peak rating of 36 hp at 2200



rpm. It is designed for operating equipment within a 25 to 36 hp range.

Light weight and compact design simplify problem of installation on equipment where weight and space limitations are important factors. Positive cooling is obtained at high temperatures from a large fan cast in the flywheel. Wisconsin Motor Corp., Dept. ST, Milwaukee 14, Wis.

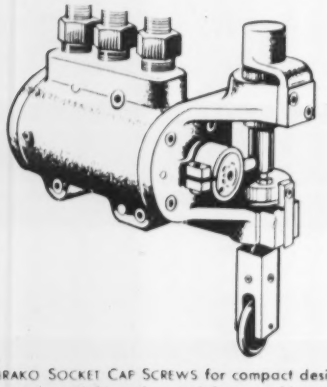
USE REPLY CARD—CIRCLE No. 4

Paint Can Attachment

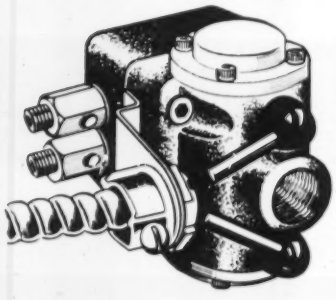
. . . prevents paint from spilling

This paint can attachment prevents paint from spilling over when pouring or mixing. It is attached by pressing firmly into gallon can, making a tight seal. Made

UNBRAKO SOCKET CAP SCREWS have knurled heads for sure grip and fast assembly; accurate hex sockets for positive, nonslip internal wrenching; fully formed threads, Class 3 fit. They are made of heat treated alloy steel, with controlled fillet and continuous grain flow, for strength; and are available in standard sizes from #4 to 1" in a full range of lengths.



USE UNBRAKO SOCKET CAP SCREWS for compact designs to save space, weight and material on machine tools and metalworking equipment.



On textile machines, automotive equipment, electrical and electronic devices, and production machinery.

Do you really need a special UNBRAKO?

Before you specify a special socket screw, check UNBRAKO Standards. A standard UNBRAKO will do the same job much cheaper in most cases. You'll get better service and faster deliveries, because UNBRAKO socket screw products are stocked by your industrial distributor. Write for UNBRAKO Standards. SPS, Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION

SPS
JENKINTOWN PENNSYLVANIA

On precision instruments, dies, jigs and fixtures, and many other applications too numerous to mention.

UNBRAKO Standards—as listed in the SPS Catalog—are stocked by leading industrial distributors everywhere.

of heavy plastic, device is tapered at the bottom to fit snugly into all gallon cans. It keeps the sealing groove free from paint when stirring, mixing, pouring or painting. Pormix Corp., Dept. ST, Greenwich, Conn.

USE REPLY CARD—CIRCLE No. 5

Magnetic Chuck

. . . features multiple poles

Power-Grip magnetic chuck features multiple poles for full work surface holding areas. It has closely spaced separators that are of 0.050-inch wide brass separated by a ⅛-inch wide mild steel spacer. Sundstrand Magnetic Products Co., division of Sundstrand Machine Tool Co., Dept. ST, Rockford, Ill.

USE REPLY CARD—CIRCLE No. 6

Tool Room Surface Grinder

. . . works from handwheel

Model D6-1 tool room surface grinder features a correlation of depth of cut to handwheel calibrations. Operator grinds directly to the handwheel calibrations without removing the workpiece for measurement except for an initial and a final check. Use of handwheel slip rings permit the operator to zero the handwheel calibrations after an initial cut and measurement.

Combination coolant system affords use of fingertip control in

selecting one of three coolant methods. These include cool grinding, where the coolant flows through the wheel to point of cut; flood grinding; or a combination of these two methods. DoAll Co., Dept. ST, Des Plaines, Ill.

USE REPLY CARD—CIRCLE No. 7

Adjustable-Length Conveyor

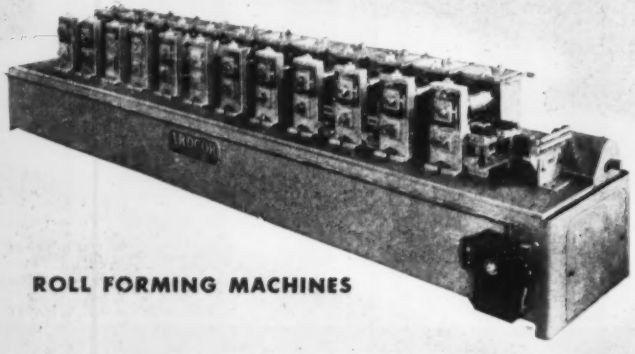
. . . adds 220 per cent in length

Double-boom adjustable-length conveyor increases its open length 220 per cent over closed length. Built for heavy-duty application, the conveyor can be placed in innumerable different positions and

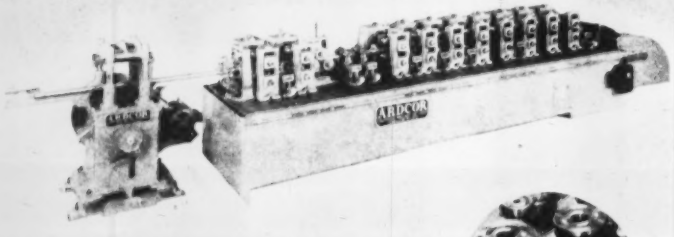
lengths and is completely counterbalanced for handling ease.

Its construction features heavy truss design to carry loads 50 to 100 pounds per linear foot, depending on the model. Conveyor will carry full loads over its entire length, even when completely extended. Models are available from 8 to 25 feet closed; from 16 to 61 feet open. Length of boom exten-

ARDCOR Engineered
MEANS BETTER COLD-ROLL FORMING



ROLL FORMING MACHINES
PUNCH TYPE CUT-OFFS
LOCK SEAM TUBE MILLS



ARDCORLOY TUBING ROLLS AND FORMING ROLLS
To Your Specifications or Ardcor Design — for all makes of machines

American ROLLER DIE CORPORATION
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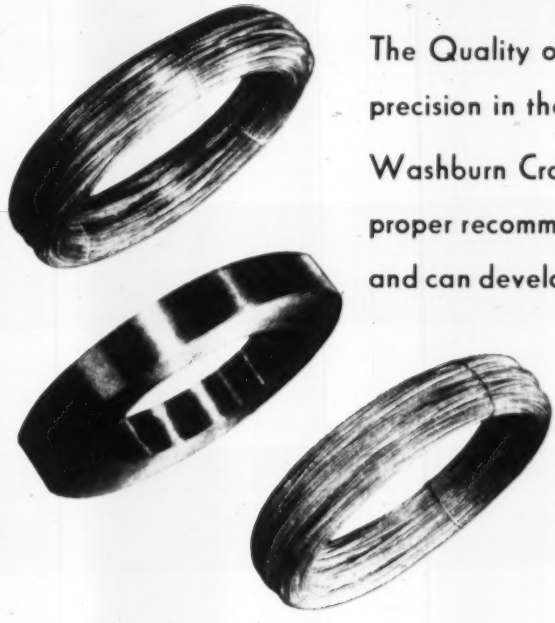
Precision assures Quality



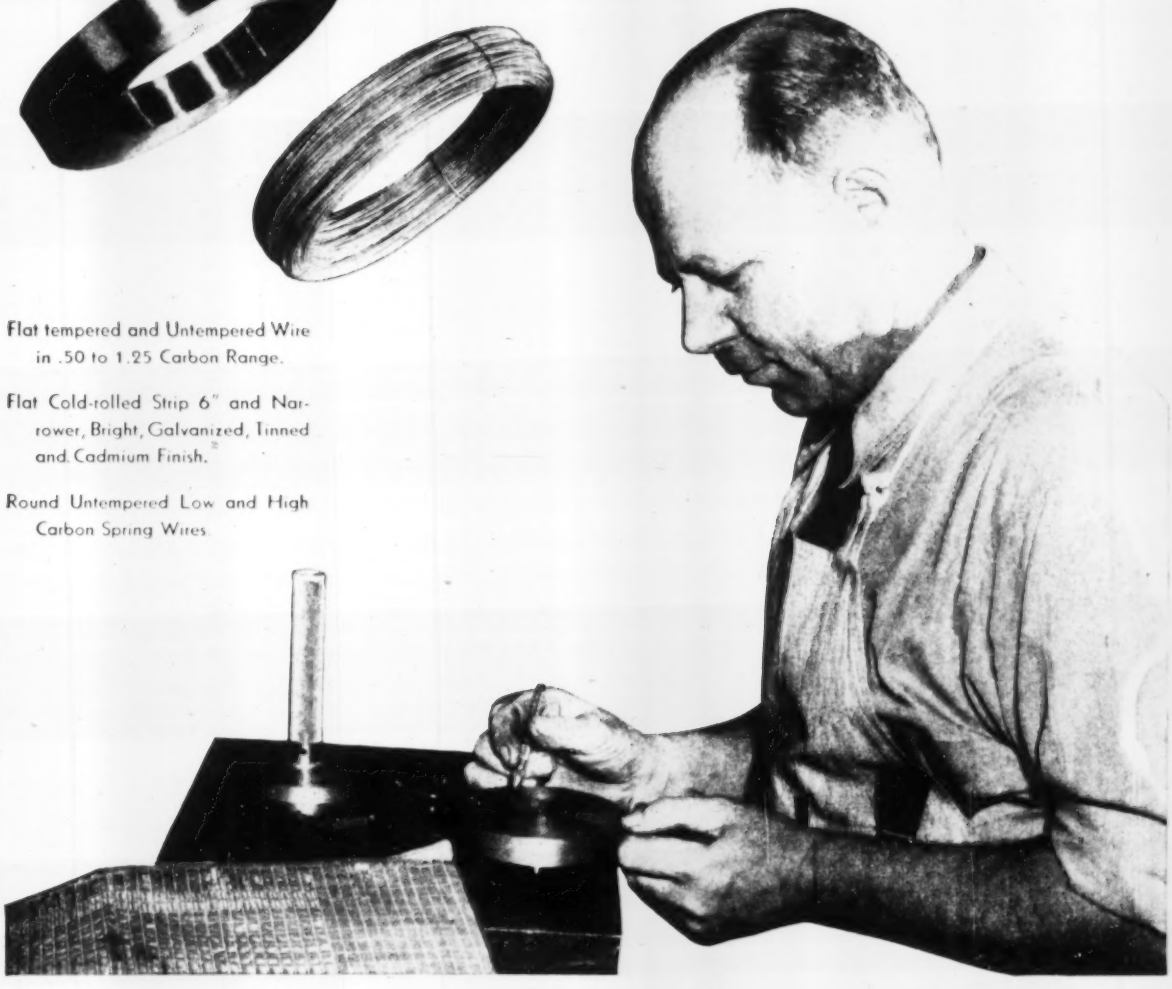
The Quality of Performance of *your* product depends on the precision in the manufacture of its component parts.

Washburn Craftsmen know, through years of experience, the proper recommendation for hundreds of widely varied products and can develop wire or strip to assure top quality performance.

Flat tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold-rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.



WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS — STRIP — RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

tiny to
giant-sized bearings

with TEAM-WORK built-in every size

With every size in SKF's wide range of ball and roller bearings, you receive an extra quality—*team-work*. This is the ability of SKF field and home office engineers to cooperate productively with your equipment designers. Helping to solve their bearing problems is the *extra* which all industries have learned to expect from SKF.

SKF
BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC., PHILA. 32, PA. — *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

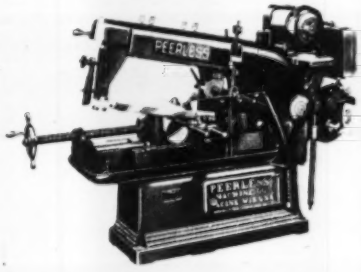
sion can be varied with instantly operated in-out buttons at each end. Stewart-Glapat Corp., Dept. ST, Zanesville, O.

USE REPLY CARD—CIRCLE No. 8

Metal Cutting Saw

. . . has open saw frame

Standard 10 x 10-inch metal cutting saw is an overarm type with open saw frame to permit loading from front or side. The model replaces the manufacturer's 9 x 9-inch model. Improvements include



heavier overarm that carries and guides the saw frame, gaining additional accuracy.

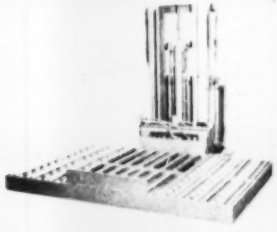
Another feature of the redesigned model is the heavy U-type frame providing wider shoulders to assure true alignment and greater accuracy. Frame also has replaceable, hardened and ground steel bearing shoes. Work clamping vise is arranged to clamp work from 90 to 45 degrees. Peerless Machine Co., Dept. ST, 1600 Junction Ave., Racine, Wis.

USE REPLY CARD—CIRCLE No. 9

Roller Platform Attachment

. . . handles unwieldly loads

Hydraulically-operated roller platform handles unwieldly boxes



from truck to storage. The four-way roller attachment is built so one man can complete the entire

CLEVELAND *Top Quality*
High Carbon
Heat Treated
Cap Screws

It's easy to select hex head cap screws when you know that *one type,* which costs very little more than the general run, has all the desirable qualities recommended by metallurgists and engineers. Cleveland High Carbon Heat Treated Cap Screws made by the Kaufman Process—the *Double Extrusion* method—"come through" with all the important points experts look for in correctly made fasteners.

Cleveland specializes in Cap Screws (all standard heads), Set Screws and Milled Studs, in unusually wide size ranges.

CLEVELAND *Top Quality* FASTENERS

operation. Hydraulically actuated from either control handle or a button on the carriage frame, the platform engages the packaged material in vertical position by means of a steel plate and rotates it to horizontal position for transporting and racking.

One set of rollers—forward and reverse—centers load on the platform, positioning it for easy racking. The other set—side to side—is used for putting the load into storage racks. Attachment is removable and conventional forks can be substituted. Lewis-Shepard Products Co., Dept. ST, Watertown, Mass.

USE REPLY CARD—CIRCLE No. 10

Improved Goggles

. . . for use on hot jobs

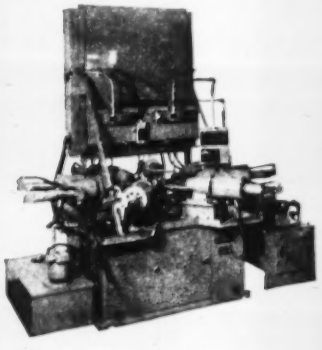
A series of features for goggles to be worn on jobs where there is extreme heat has been developed: Nontoxic, heat resistant and perspiration proof vinyl binding on side shields, eye binders and bridges is more comfortable. Featuring permanently stitched on eye binders and bridges and heat sealed side shields, these vinyl-clad metal goggles can be washed or sterilized as often as necessary. American Optical Co., Dept. ST, Southbridge, Mass.

USE REPLY CARD—CIRCLE No. 11

Automatic Drilling Machine

. . . rate: 3840 holes per hour

This machine drills 32 holes 3/16-inch diameter in a steel part at a rate of about 120 pieces, or 3840 holes, per hour. The machine incorporates eight model HH automatic drilling units electrically interlocked with automatic, hydraulically-operated clamping and indexing.



The part is clamped automatically and the eight holes drilled simultaneously at each of the four indexes. Part is unclamped automatically. Govro-Nelson Co., Dept. ST, 1933 Antoinette, Detroit 8, Mich.

USE REPLY CARD—CIRCLE No. 12

Vacuum Switch

. . . shuts off power source

Vac-on vacuum switch shuts off the power source when liquid supply runs dry. Designed for use with electric motors and gasoline engines, it is used as a circuit-breaker or control where safety of equipment depends on suction-delivered lubricant, fuel, water, or similar liquid. It is mounted on the suction line and is wired into power supply on electric motors, or the spark system on gasoline engines. When suction falls below

GLOBE
SUPERIOR
LADLE
BRICK
last longer
The greater heat resistance of GLOBE brick is well known in the steel industry. Because these bricks, wire cut or dry pressed, last longer—saving much time lost in refractory replacement—they help increase melting capacity. There is a type for every need, so let us place our experience at your disposal.
SERVING THE STEEL INDUSTRY SINCE 1873
The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

SOUTH BEND 2-H TURRET LATHE

Keeps Costs Down on Precision Parts

This precision-built turret lathe is designed specifically for the machining of accurate, duplicate parts. It is especially suited for large-volume, second operations that require close tolerances and smooth finishes.

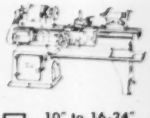
The wide ranges of its 48 power cross feeds, 48 power longitudinal feeds, 48 thread cutting feeds and 96 power turret feeds provide combinations that permit maximum cutting efficiency through the entire machining cycle. And conveniently placed controls make machine handling effortless.

Now is the time to find out how this precision turret lathe can help keep down the cost of your small, precision parts.

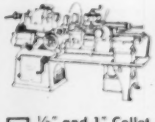
MODEL 2-H
PRECISION TURRET LATHE
Available with 6" or 7" bed, 28¾" or 40½" maximum spindle nose to turret face distance; 1" collet capacity; 1⅛" hole through spindle. Turret has adjustable feed stops for each tool, power feed trips out at stop setting. Double tool cross slide, 9¼" travel.

SEND INFORMATION CHECKED:

☐ 9" and 10" BENCH LATHES



☐ 10" to 16-24" FLOOR LATHES



☐ ½" and 1" Collet TURRET LATHES

☐ 14" DRILL PRESSES

☐ 7" BENCH SHAPERS

Name _____ Company _____

Street _____ City & State _____

Building Better Tools Since 1906 • **SOUTH BEND LATHE** • **South Bend 22, Indiana**

a predetermined negative pressure, switch cuts off motor. Jaycon Associates, Dept. ST, 404 N. Washington Ave., Minneapolis, Minn.

USE REPLY CARD—CIRCLE No. 13

Cutting Lubricant

. . . no metal-to-metal friction

Anchorlube is a cutting lubricant for tapping, theading, spotfacing, counterboring, form finishing, hollow milling and similar metalworking operations. It provides a positive adhesive film between tool and work to eliminate friction resulting from metal to metal contact. Anchor Chemical Co., Dept. ST, 10721 Briggs Rd., Cleveland 11, O.

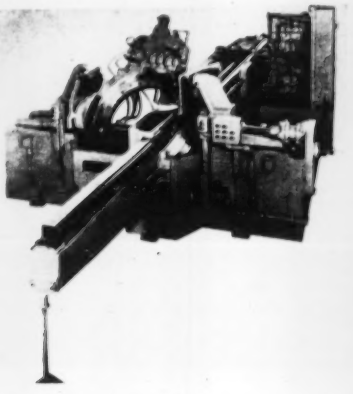
USE REPLY CARD—CIRCLE No. 14

Horizontal Broaching Machine

. . . special trunnion fixture

This horizontal broaching machine is equipped with special trunnion fixture for internal operation. Indexing, diameter of the work and angle of cut can all be adapted to requirements of the workpiece. Machine is basically a standard 10-ton, 90-inch stroke machine. Diameter variation is accommodated by changing internal support ring in the fixture.

An internally-mounted rotor in the trunnion fixture is actuated by



an index mechanism mounted on top of the fixture. This allows the workpiece to be advanced in accurate increments in accordance with workpiece specifications. Colonial Broach Co., Dept. ST, Box 37, Harper Station, Detroit 13, Mich.

USE REPLY CARD—CIRCLE No. 15

Inspection Protractor

. . . measures sheet metal angles

Protractor for measuring work performed on sheet metal parts permits a quick check on angles formed by equipment such as hydraulic presses. Accuracy of Angle-Chek is reported to be within plus or minus 5 minutes. Sheridan-Gray Inc., Dept. ST, 405 Via Chico, Palos Verdes Estates, Calif.

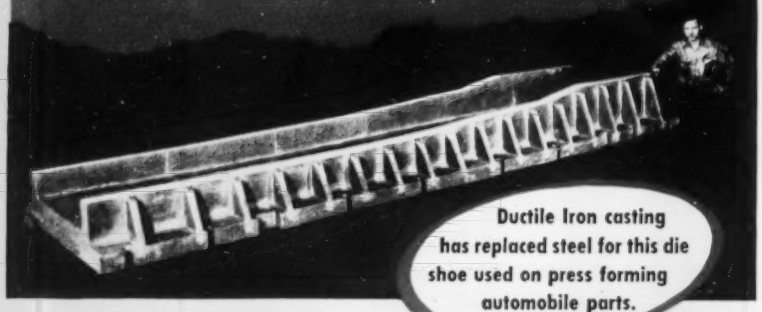
USE REPLY CARD—CIRCLE No. 16

Plastic Floor Finish

. . . applied with a mop

Skid-Not, a transparent plastic floor finish, is applied with a mop. It forms a semigloss, nonglare finish. It can be applied over varnish or enameled wood, rubber or asphalt tile, cork, terrazo or mag-

DUCTILE IRON
NEW ENGINEERING MATERIAL



Ductile Iron casting has replaced steel for this die shoe used on press forming automobile parts.

- TENSILE STRENGTH
  60,000 PSI, to 115,000 PSI
- ELONGATION
  As cast: approx. 3%
  Annealed: 15% to 22%
- YIELD STRENGTH
  45,000 PSI to 65,000 PSI

A variety of Ductile Iron castings

A pioneer in the production of this remarkable metal, the BELOIT FOUNDRY conducts a constant program of research and analysis to meet the growing demand for Ductile Iron. We will gladly answer inquiries about applications of Ductile Iron (or our other irons) to your products.

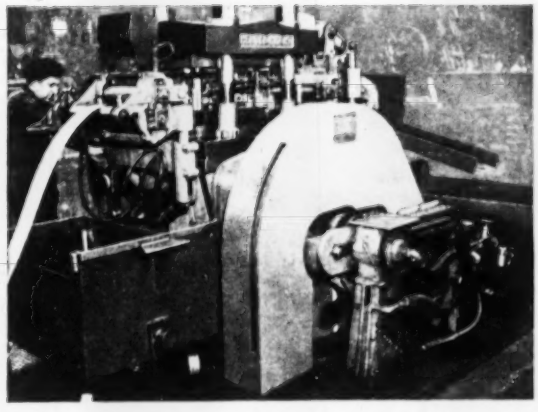
BELOIT FOUNDRY CO.
High test Iron, Alloy Irons, and Ductile Iron
Castings from a fraction of a pound thru 50 tons
BELOIT, WISCONSIN

BF

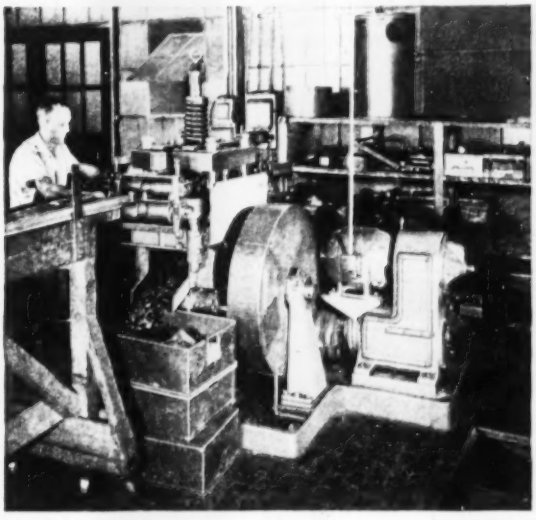
DETROIT OFFICE
8100 Lyndon Ave.
Phone Texas 4-1227

Chicago Office
8525 Vincennes Ave.
Phone Radcliffe 3-4114

Modernize Metal Stamping
with Henry & Wright Dieing Machines



In Chrysler's Highland Park plant (above), Henry & Wright Dieing Machines are used to make fluid coupling fins and torque converter impeller blades. At Knapp Monarch (below), Dieing Machines produce rotor and stator laminations complete per stroke.



IT PAYS 3 BIG WAYS

1. ***Combine operations -- use progressive stamping more efficiently, for more parts***
2. ***High quality work at high speed***
3. ***High speed plus long die life***

In Plant After Plant Henry & Wright Dieing Machines are setting new record highs in the number of pieces produced per hour, in work quality and die life. A high production tool, this unique press is proving that it can do as much work as five to ten conventional presses. It provides both high speed and long die life—a combination unavailable in any other press.

Only the best is good enough

Capacities of Henry & Wright Dieing Machines range from 25 tons to 2500 tons pressure. Our catalog—available upon request—describes machines up to 400 tons. Larger capacities are custom built to requirements. Write Henry & Wright, 461 Windsor St., Hartford 5, Conn.

HENRY & WRIGHT
Division of Emhart Mfg. Co.

Fresh from trade school . . .

but he knows his grinding wheels!

SIMONDS ABRASIVE CO.

Grinding Wheels

The right start on any grinding job is knowing the right wheels to use. Simonds Abrasive Company's complete line enables *you* to do this on all your grinding operations . . . snagging, semi-finishing or finishing . . . sharpening, cutting off or polishing.

These are high quality production tools . . . accurately specified, rigidly tested . . . backed by an established reputation for consistently superior performance . . . and supplemented by a field engineering service to meet your needs for specialized wheels.

It will pay *you* to find out about Simonds Abrasive Company products . . . and the man who can supply them. Write for name of your distributor. Also ask for free data book.

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON

DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y. Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

NEW PRODUCTS and equipment

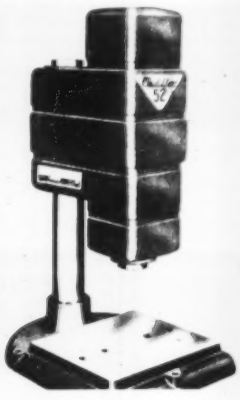
nesite floors. This product is recommended for use wherever a nonslippery, long-lasting finish is required. Monroe Co. Inc., Dept. ST, 10703 Quebec Ave., Cleveland 6, O.

USE REPLY CARD—CIRCLE No. 17

Air Impact Press

. . . 10,000 strokes per hour

Model 52 air impact press offers speeds to 10,000 strokes per hour on high speed marking operations. Pressure is available up to 8 tons and is adjustable from light to



heavy marking. It can also be regulated for branding or color leaf marking.

In other varied uses, the press is applicable for assembling, staking, crimping, riveting and for producing light stampings. It can be actuated by hand, foot or electrical controls. Light weight construction makes it movable to any location where installation is desired. For average work, no special jigs or fixtures are required. Cadillac Stamp Co., Dept. ST, 17315 Ryan Rd., Detroit 12, Mich.

USE REPLY CARD—CIRCLE No. 18

Cutting Torch Guides

. . . fit all torch makes

Precision cutting guides for individual gas flame metal-cutting torches permit cutting accurate circles, straight lines, bevels and many other shapes without special worker training. Particularly valuable on emergency or short-run jobs, guides are made in three principal types to fit all makes of

It gives you what kings couldn't have

WHEN you take a canned product from your grocer's shelf, it probably never occurs to you that the familiar tin can permits you to live *better* than a king of old.

It provides you with a balanced, nutritious diet. It brings you the delicacies of many lands. In season or out, the food you desire is within your immediate grasp.

In countless ways, the versatile can is an essential part of convenient, modern living — thanks to the continuing research and ingenuity of can manufacturers and the canning industry.

Kaiser Steel is proud to serve this great industry, through production of urgently needed tin plate at its new mill in Fontana.

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • tin plate • hot rolled strip • hot rolled sheet alloy bars • carbon bars • structural shapes • cold rolled strip • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

Engineer answers vital questions about the strongest wire rope made—Flattened Strand

Why does Hercules® Flattened Strand wire rope continue to outperform round strand rope by 2 to 1 or more? Can you use it? Here, Walter C. Richards, chief engineer, A. Leschen & Sons Rope Co., tells you.

More and more wire rope users are continually experiencing or hearing about spectacular performances of Hercules Flattened Strand wire rope. The explanation is clear.

First, Hercules Flattened Strand is a Super-rope because it packs 10% more steel than any round strand rope of the same size. It's 10% stronger... 10% safer.

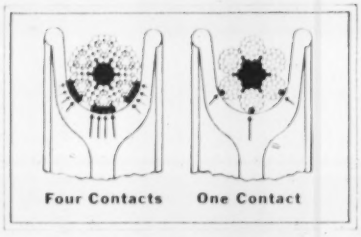
Second, Hercules Flattened Strand wears longer and more evenly. That's because there are four wires per strand contacting sheave grooves instead of one.

Third, Hercules Flattened Strand resists crushing and internal strand-cutting, because strands rest snugly against each other, keystone fashion, with less internal pressure or friction.

Fourth, Hercules Flattened Strand prolongs its own life and the life of equipment, because the relatively smooth surface of the rope prevents corrugating and wear on sheave grooves.

Can you use it?

It's a known, proved fact that no other wire rope made can equal Flattened Strand on applications such as hot ladle cranes, skip hoists, and dredge ropes. It is also best on a variety of other equipment both large and small. For many uses, it is truly a Super-rope.



With Flattened Strand, notice how four wires per strand contact sheave grooves —reducing rope and equipment wear.

But, the question is, can *you* use it to advantage? That can be answered only by a qualified wire rope engineer who is thoroughly acquainted with the characteristics and proper uses of Flattened Strand rope.

Check with the authority

That means, check with Leschen. It's wise to do so because Leschen pioneered and perfected Flattened Strand wire rope. Leschen developed special machines to make it. Leschen conducts continuing research on correct uses. Leschen is the authority.

If you discover you can use this Super-rope—Hercules Flattened Strand—you'll soon begin saving time, labor and money. Why not investigate *now*?

Hercules Flattened Strand wire rope made by
A. LESCHEN & SONS ROPE COMPANY
St. Louis 12, Missouri

In business only to make wire rope . . . better wire rope . . . since 1857

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torches from 70 to 90-degree models.

Types include a small circle guide for cutting circles from 1 to 15 inches diameter; a large guide for circles 10 to 66 inches diam-

eter; and a straight-line guide that can be arranged for straight and 60 or 45-degree bevel cutting. New Era Engineering Co., Dept. ST, 458 W. 29th St., Chicago 16, Ill.

USE REPLY CARD—CIRCLE No. 19

Solvent Phosphating Cleaner

. . . cleans, protects metal

Solvent phosphating cleaner, called Solo-Phos, removes grease and tar, cleans off chips and provides a rust-inhibitive phosphate coating. Used for one-step cold cleaning and phosphating of ferrous metals, aluminum and zinc, it reacts with organic or metallic soils. It has high solvency for oil, grease and tar, and its rust-inhibitive film makes a good base for painting.

Cleaner can be applied in concentrated form by spraying, flushing or dipping, using standard equipment. After reaction, it should be

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

69. Weldment Cleaning

American Wheelabrator & Equipment Corp. Just how airless blast cleaning is used on large weldments in a leading Midwestern plant is described in illustrated bulletin 864. Included in this case study are facts and figures showing cost savings effected.

70. Metering & Controls

Automatic Control Co. 4-page illustrated publication "The Autocon Rambler" deals with line of remote metering systems and automatic controls for such equipment as pumps. It will be sent regularly to those concerned with automatic control systems.

71. Colloidal Graphite

Acheson Colloids Co. Summary of how "dag" colloidal graphite functions as a high temperature lubricant is contained in illustrated bulletin 123. Its composition, several case studies and various applications are covered in its 4 pages.

72. Adjustable Speed Drive

Reliance Electric & Engineering Co. 8-page illustrated bulletin D-2306 gives you technical data, construction features, selection information and dimensions of V°S drives for planers. How it is used with electronic controls for rapid reversals is explained.

73. Electrodes For Cast Iron

Alloy Rods Co. Machinable welds on cast iron can be made with Nickel-Arc 60 electrodes, described in illustrated bulletin AR52-2218. Recommended welding procedures, other data and application examples are included.

74. 15-Inch Precision Level

Niles-Bement-Pond Co., Pratt & Whitney Div. Wherever horizontal planes must be determined within close limits the P & W 15-in. precision level can be used. Described and illustrated in 4-page circular 544, its scale can be read to a 0.0005-in. variation from the horizontal in 1 ft.

75. Gouging & Cutting

Arcair Co. How to gouge and cut all metals with only carbon arc and compressed air is told in 4-page folder on the "Arcair Torch." Applications for removing pads and gouging defects in alloy steel castings, for cutting out corroded section in pressure vessels and back gouging welds are illustrated.

76. Metal Crusher

American Pulverizer Co. Offered as a simple means for reducing metal turnings to chips and thus obtaining maximum return from scrap, the model 1700 rolling ring crusher is described in 2-page data sheet. Machine has capacity of 1 to 1½ tons per hour and will handle alloy steel, steel, aluminum, brass, copper or bronze turnings.

77. Cutting Abrasive

Allison Co. General recommendations for selection of Allison abrasive wheels, a chart relating best wheel for dry or wet cutting many materials and much basic cutting info is contained in 16-page illustrated brochure "Abrasive Cutting by Allison." Data on types of cutting machines and maintenance of them are included.

78. Wire Rope Sling Guidance

A. Leschen & Sons Rope Co. 54 pages of practical information on the selection and use of wire rope slings are contained in Sling and Fitting Handbook No. FS-52. Charts show proper calculations to be used in determining the size of sling required in a given application, the correct sling angles in relation to the load and procedures in applying fittings.

2-23-53

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79. Abrasive Wet Blasting

Abrasive Wet Blast, Inc.—Abrasive Wet Blast, the liquid abrasive surface treatment which cleans, finishes, etches and blends production items and tools; what it does; why it's better; and how it works are covered in 4-page brochure. Specs on the Wet Blast machine are given as well.

80. Transfer Machine

Avey Drilling Machine Co. Here, in a 4-page illustrated bulletin, you can read how sixty (60) tractor crankshafts were given a series of holes on a 12-station transfer machine, the Avey Line-O-Dex. Design of machine is shown and operation sequence is summarized.

81. Welding Process

Air Reduction Sales Co. 12-page catalog 17 describes equipment and supplies employed in the Aircomatic inert-gas-shielded metal-arc welding process. Both No. 3 and No. 20 manual guns and the head for automatic operation are covered, along with wires used in this equipment.

82. Universal Joints

Apex Machine & Tool Co. There's a size and type of heavy duty universal joint for every aircraft and industrial application shown in 32-page illustrated catalog 27. Guidance in specifying and applying joints for specific devices is provided. Included are application data sheets perforated for easy use.

83. Oxygen & Nitrogen

Air Products Inc. Tonnage and high-purity type oxygen - nitrogen generators are subject of descriptive 12-page catalog 52 which also points out advantages and illustrates typical installations. Performance data on both types is tabulated. Units can produce up to 2500 and 12,000 cfh. respectively.

84. Timing Relays

Allen-Bradley Co. Besides having a selection chart for this entire line of timing relays, 16-page illustrated bulletin outlines features, applications, adjustment and operation of each of several types. Bulletin 848, 849, 850 and 852 relays are covered. Engineering data is given.

85. Engine Lubricants

Alpha Corp. Just how and why Molykote lubricants are effective over a temperature range from far below zero to 750° F. are explained in 6-page illustrated folder 96. This lubricant features antiseizing properties, low coefficient of friction at extreme bearing pressures and tenacity when applied to metal surfaces.

86. Welding Alloys Wall Chart

All-State Welding Alloys Co. Measuring 18 x 27 in., this wall chart covers properties and applications of 41 welding rods and electrodes, plus the best flux for welding, brazing, soldering, cutting or tinning.

EDITORIAL REPRINTS:

87. Metal Joining

In metal joining, low heat requirements of organic resin bonding eliminates heat-affected zone and minimizes heat distortion common in welding, brazing and soldering. A versatile bonding method adaptable to present production facilities is described in STEEL reprint "Joining Distortion Minimized" by H. Thielsch and J. R. Charlton.

88. Cutting Speed

In STEEL reprint "Cutting Speed: Horizons Limited," Hans Ernst of Cincinnati Milling Machine Co. formulates an easy way to figure the fastest practical cutting speed for machine tools. He writes on the contention that jacking cutting speeds up to the sky doesn't necessarily lead to a "promised land" of production and everlasting tool life.

89. Seamless Tubing

G. B. Brown of Tube Reducing Corp., in STEEL reprint, "Powerful Giant Will Reduce 18-Inch Tubes" describes machine which will produce world's largest light-wall seamless tubing by a cold reducing method. This giant, still in the preliminary design stage, will dwarf all existing machines.

90. Modern Checking Devices

To meet precision demands, producers of tool steel must utilize the most modern testing device at every stage of production. Close coordination between industry and users advances the art. L. C. Grimshaw of Firth Sterling Inc., in STEEL reprint "Close Checks Produce Top Tool Steels," covers some of the latest equipment and methods used to assure top tool steel production.

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4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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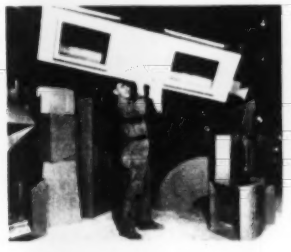
spray rinsed. Cleaner will not attack rubber-tired wheels, painted or plated surfaces, and it can be applied over plastic-coated parts. Whitfield Chemical Co., Dept. ST, 14225 Schaefer Highway, Detroit 27, Mich.

USE REPLY CARD—CIRCLE No. 20

Polyester Laminate Tanks

. . . no size, shape limits

Tanks and ducts can be fabricated to specification from Iolyte, a Fiberglas reinforced polyester laminate. Fabrication is done without use of molds and no size or shape limitation is made. The lightweight



product is a chemical-resistant structural plastic, not a coating.

Made without molds, the tanks are not tapered, making the entire area available. Ducts are especially recommended for corrosive fume application. Schori Process Division, Ferro-Co Corp., Dept. ST, 8-11 43rd Rd., Long Island City 1, N. Y.

USE REPLY CARD—CIRCLE No. 21

Spectacle Type Goggle

. . . with plastic frames

Model 707 spectacle type safety goggle has a plastic frame that is designed to retain safety lens even when subjected to severe impact. Wire core temples have cable-wound ends that permit easy adjustment for a comfortable fit. Pennsylvania Optical Co., Dept. ST, Reading, Pa.

USE REPLY CARD—CIRCLE No. 22

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Sperry

Reflectoscope TESTING

is available in your plant . . . AS YOU NEED IT!

SPERRY INSPECTION SERVICE now makes fast, dependable, non-destructive testing available for every plant. You can have an experienced inspection engineer using a Sperry Reflectoscope — when you need them — for any desired length of time from four hours up.

Take advantage of this opportunity to improve product quality and increase customer acceptance . . . or use a Reflectoscope to eliminate costly down-time for periodic machinery inspections.

Practically every type of material can be tested; hidden defects are quickly and reliably located in up to 30 feet of solid steel. Parts may be checked without dismantling. Write now for complete information.

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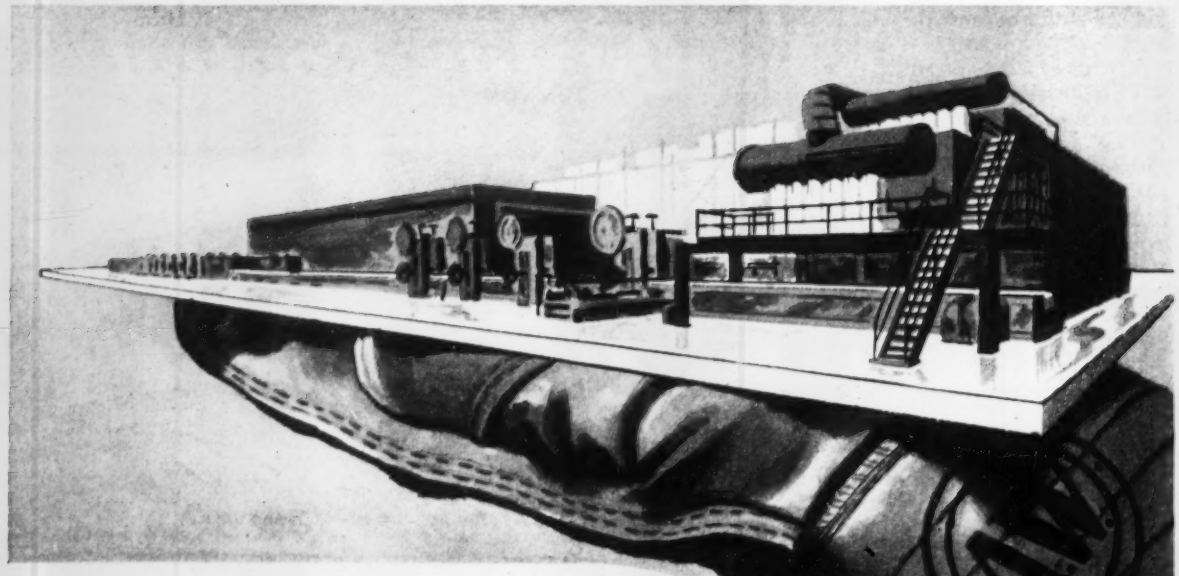


ALAN WOOD'S 30" STRIP MILL
SERVING YOU SINCE JANUARY 2, 1950

• The Alan Wood 30" continuous mill continues to produce at top speed plates, sheets and strip.

Everything possible is being done to improve our facilities and to expedite production to give you the best possible service.

Remember, too, that Alan Wood's mine-to-mill integrated production line assures you of high grade steel.

Over A Century and a Quarter of Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

Conshohocken, Pennsylvania

IVY ROCK, PA. • SWEDELAND, PA. • DOVER, N. J. • OXFORD, N. J.

The Market Outlook

OPEN-ENDING of the Controlled Materials Plan will have little effect on any consumer's steel supplies in the first half of this year.

Open-ending, effective Feb. 13, means that any steel produced in excess of that needed to supply government-authorized allotments to consumers can be sold without regard to allotments. But there likely will be little of this excess steel in the finished forms that are in strongest demand, for there are enough CMP tickets in circulation to sop up all of the hard-to-get items. The products in which there will be "free" steel will be those that already are plentiful.

COVERED—To see how well the carbon steel supply will be covered with CMP tickets, look at the CMP allotments for second quarter. They total 26,168,000 net tons, which is 15 per cent more than the estimated supply of 22,778,000 net tons. The government issues this excess of tickets to make sure there are enough to cover all of the steel that will be produced.

POSSIBILITY—Also suggesting that there will be more than enough tickets to cover all of the hard-to-get steel products is the widely held fear that many steel consumers will insist on buying freely available products, such as wire and wire products, wire rod and small bars, without surrendering their CMP tickets and that they will use their tickets largely to get more of the scarce steel products like heavy shapes, heavy plates, large bars, forging bars, large diameter tubing, and hot-rolled and cold-rolled sheets.

The Office of Defense Mobilization will watch the market conditions closely so that if mills and consumers show a tendency to let the situation get out of hand, remedial measures may be taken.

CONCERNED—Some of the small consumers are concerned as to possible effectiveness of free distribution of steel. They feel they may be at a great disadvantage in obtaining steel because of the pressure the bigger buyers can exert upon producers. This, however, is not a problem they will run smack up against for a while. Despite any fears they may hold, they have a feeling that a free market will prove to be the better in the long run, even for them.

OPTIMISTIC—How long will steel remain in strong demand? Everyone has been confident it would be strong enough to keep mills producing at capacity during the first half of this year, but there has been a reluctance to make predictions for the second half, and those bold enough to venture an opinion have been inclined to believe demand could not sustain capacity operations. Now, Avery C. Adams, president, Pittsburgh Steel Co., predicts the steel industry will operate all this year at capacity.

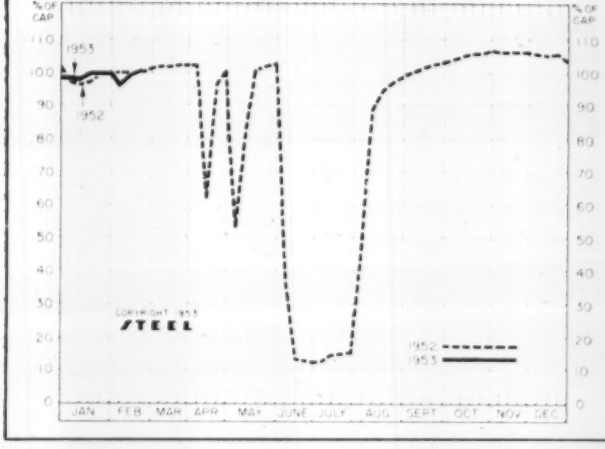
FULL TILT—In continuing full operations, the steel industry in the week ended Feb. 21 produced steel for ingots and castings at the rate of 100.5 per cent of capacity. This is a 1-point increase over the preceding week.

With the automobile industry staging a big production push, cold-rolled steel sheets are one of the most sought items. Open-ending of steel distribution increased pressure for this product.

CATCHING UP—Although steel as a whole is in strong demand, there are continuing signs of an approach toward balance between supply and demand in even some of the scarcest products. On the West Coast, weaker demand for merchant bars is spreading to the popular sizes. In some areas of the country, inventories of warehouses, suppliers to the small consumers, are improving gradually as mills become increasingly current on deliveries. Even plates, structurals and bars are in slightly better supply on more sizes.

Decontrol on Feb. 13 of prices of iron and steel scrap brought no immediate change in prices, except on the West Coast where the price structure was further undermined. The market may shape up more definitely within another week. Opinion is mixed as to whether decontrolling of prices will lead to higher prices on prime grades.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Feb. 21	Change	Same Week 1952	Same Week 1951
Pittsburgh	106	— 1*	102	100.5
Chicago	102†	0*	102.5	102
Mid-Atlantic	95†	— 2	98	99.5
Youngstown	106	0	105	102
Wheeling	100.5†	0	100.5	95
Cleveland	100†	+ 2	98.5	97.5
Buffalo	106.5	0	104	104
Birmingham	97	0	104	100
New England	85†	+ 4	88	90
Cincinnati	90	— 3	89	98
St. Louis	92.5	0	68.5	87
Detroit	100.5	0	101.5	100
Western	110	+ 1	106	104
Estimated national rate	100.5	+ 1	100	99.5

*Change from preceding week's revised rate.
†Estimated rates are based on Jan. 1, 1953 capacities; others on Jan. 1, 1952 capacities.
Weekly steelmaking capacity is estimated at 2,254,450 net tons in 1953; 2,077,940 tons in 1952; 1,969,034 tons in 1951.

The Metalworking Outlook p. 37 Production-Engineering News p. 81

Composite Market Averages

FINISHED STEEL PRICE INDEX. Bureau of Labor Statistics (1947-1949 = 100)	Feb. 17 1953	Feb. 10 1953	Month Ago	January Average
	130.5	130.5	130.7	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Feb. 17, 1953

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952

Rails	$5.775	Sheets, C.R. carbon	$5.275
Tracks spikes	6.650	Sheets, galv.	6.845
Track bolts	9.925	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.089
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.778
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.449	Wire, carbon, merchant	6.975
Bars, carbon	4.100	Wire, fence, galv.	6.425
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.880
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted. Calculated by STEEL*	Feb. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	134.56
Index in cents per lb	4.912	4.912	4.912	4.657	3.645

ARITHMETICAL PRICE COMPOSITES. Calculated by STEEL*					
Finished Steel NT	$110.93	$110.93	$110.93	$106.32	$81.136
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.54	39.84
Basic Pig Iron, GT	54.96	54.96	54.96	52.16	39.376
Malleable Pig Iron, GT	55.77	55.77	55.77	51.27	40.18
Steelmaking Scrap, GT	43.00	43.00	43.00	45.00	40.25

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Feb. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.302	4.302	4.302	4.15	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	4.13	3.90	2.968
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.71
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.95
Strip, H.R., Pitts.	3.925	3.925	4.225	3.975-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.71
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.775
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	4.20
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.70
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.00	$70.00	$70.00	$66.00	$54.00
Wire rods, ⅜-⅝", Pitts.	4.425	4.425	4.425	4.10-30	3.175
PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.00
Basic Valley	54.50	54.50	54.50	52.00	39.00
Basic del. Phila.	59.25	59.25	59.25	56.50	42.00‡
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	56.50	42.50‡
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.58	40.71
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*
SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt. Pitts.	$41.00	$41.00	$41.00	$45.00	$40.50
No. 1 Heavy Melt. E. Pa.	41.50	41.50	41.50	41.50	42.00
No. 1 Heavy Melt. Chicago	42.50	42.50	42.50	43.50	39.25
No. 1 Heavy Melt. Valley	44.00	44.00	44.00	45.00	40.25
No. 1 Heavy Melt. Cleve.	43.00	43.00	43.00	44.00	39.75
No. 1 Heavy Melt. Buffalo	43.00	43.00	43.00	44.00	43.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	49.75
No. 1 Cast, Chicago	43.00	43.00	43.00	49.00‡	66.00

* F.o.b. cars, Pittsburgh.

‡ F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.75	$12.50
Beehive, Fdry. Connlsvl.	17.00	17.00	17.00	17.50	14.75
Oven, Fdry. Chicago	24.50	24.50	24.50	21.00	18.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	----	60.78	61.28	----
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38	----	----
Birmingham R2	50.88	51.38	----	----
Birmingham S9	----	51.38	----	----
Woodward,Ala. W15	50.88	51.38	----	----
Cincinnati, del.	----	58.93	----	----
Buffalo District				
Buffalo R2	54.50	55.00	55.50	----
Buffalo H1	54.50	55.00	55.50	----
Tonawanda,N.Y. W12	54.50	55.00	55.50	----
No.Tonawanda,N.Y. T5	----	55.00	55.50	----
Boston, del.	65.15	65.65	66.15	----
Rochester,N.Y., del.	57.52	58.02	58.52	----
Syracuse,N.Y. del.	58.62	59.12	59.62	----
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50	----	55.00	----
IndianaHarbor,Ind. I-2	54.50	----	55.00	----
So.Chicago,Ill. W14	54.50	55.00	55.00	----
So.Chicago,Ill. Y1	54.50	55.00	55.00	----
So.Chicago,Ill. U5	54.50	----	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich., del.	----	61.30	61.30	----
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	----
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain,O. N3	54.50	----	----	55.50
Duluth I-3	----	----	55.00	----
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1	----	59.50	60.00	----
Fontana,Calif. K1	60.50	61.00	----	----
GraniteCity,Ill. G4	56.40	56.90	57.40	----
St.Louis, del. (inc. tax)	57.15	57.65	58.15	----
Ironton,Utah C11	54.50	55.00	----	----
Geneva,Utah C11	54.50	55.00	----	----
LoneStar,Tex. I-6	50.50	*51.00	51.00	----
Minnequa,Colo. C10	56.50	57.50	57.50	----
Rockwood,Tenn. T3	----	----	58.50	----
Pittsburgh District				
Neville Island,Pa. P6	----	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.	----	56.37	56.37	56.87
McKeesRocks, del.	----	56.04	56.04	56.54
Lawrenceville, Homestead,				
Wilmerding, Monaca, del.	----	56.66	56.66	57.16
Verona, Trafford, del.	----	57.19	57.19	57.69
Brackenridge, del.	----	57.45	57.45	57.95
Bessemer,Pa. U5	54.50	----	55.00	55.50
Clairton,Ranklin,So.Duquesne,Pa. U5	54.50	----	----	----
McKeesport,Pa. N3	54.50	----	----	55.50
Monessen,Pa. P7	56.50	----	----	----
Sharpsville,Pa. S6	----	----	55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	----	----
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	----
Youngstown Y1	54.50	55.00	55.00	----
Youngstown U5	54.50	----	----	55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton (Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson,O. G2 J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)	
NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, Off & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., Off & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton (Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Feb. 19, 1953, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $81.00
Munhall,Pa. U5 ... 54.00
Seattle S24 ... 75.00

INGOTS, Alloy (NT)
Detroit R7 ... $57.00
Fontana,Calif., K1 ... 81.00
Houston S6 ... 63.00
Midland,Pa. C18 ... 57.00
Munhall,Pa. U5 ... 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $59.00
ClairtonPa. U5 ... 59.00
Ensley,Ala. T2 ... 59.00
Fairfield,Ala. T2 ... 59.00
Fontana,Calif. K1 ... 78.00
Gary,Ind. U5 ... 59.00
Johnstown,Pa. B2 ... 59.00
Lackawanna,N.Y. B2 ... 59.00
Munhall,Pa. U5 ... 59.00
So.Chicago,Ill. U5 ... 59.00
SoDuquesne,Pa. U5 ... 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $70.50
Buffalo R2 ... 76.50
Canton,O. R2 ... 76.50
Clairton,Pa. U5 ... 76.50
Cleveland R2 ... 76.50
Conshohocken,Pa. A3 ... 77.50
Detroit R7 ... 73.50
Ensley,Ala. T2 ... 76.50
Fairfield,Ala. T2 ... 76.50
Fontana,Calif. K1 ... 85.50
Gary,Ind. U5 ... 76.00
Geneva,Utah C11 ... 76.00
Houston S6 ... 78.50
Johnstown,Pa. B2 ... 76.50
LackawannaN.Y. B2 ... 76.50
LosAngeles B3 ... 85.50
Munhall, Pa. U5 ... 76.50
Seattle B3 ... 85.50
So.Chicago, R2,U5,W14 ... 76.00
So.Duquesne,Pa. U5 ... 76.00
So.SanFrancisco B3 ... 85.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... 76.00
Buffalo R2 ... 76.00
Canton, O. R2 ... 76.00
Canton,O. T7 ... 78.00
Conshohocken,Pa. A3 ... 83.00
Detroit R7 ... 79.00
Fontana,Calif. K1 ... 96.00
Gary,Ind. U5 ... 76.00
Houston S6 ... 84.00
Ind Harbor,Ind. Y1 ... 76.00
Johnstown,Pa. B2 ... 76.00
Lackawanna,N.Y. B2 ... 76.00
LosAngeles B3 ... 96.00
Massillon,O. R2 ... 76.00
Midland,Pa. C18 ... 76.00
Munhall,Pa. U5 ... 76.00
So.Chicago, R2,U5,W14 ... 76.00
So.Duquesne,Pa. U5 ... 76.00
Struthers,O. Y1 ... 76.00
Warren,O. C17 ... 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ... 87.50
Canton,O. R2 ... 87.50
Cleveland R2 ... 87.50
Fontana,Calif. K1 ... 108.50
Gary,Ind. U5 ... 87.50
Massillon,O. R2 ... 87.50
So.Chicago,Ill. R2 ... 87.50
So.Duquesne,Pa. U5 ... 87.50

SHEET BARS (NT)
Fontana,Calif. K1 ... 93.18

SKELP
Aliquippa,Pa. J5 ... 3.65
Munhall,Pa. U5 ... 3.50
Warren,O. R2 ... 3.50
Youngstown R2 U5 ... 3.50

WIRE RODS
Alton,Ill. L1 ... 4.70
AlabamaCity,Ala. R2 ... 4.325
Buffalo W12 ... 4.325
Cleveland A7 ... 4.325
Donora,Pa. A7 ... 4.325
Fairfield,Ala. T2 ... 4.325
Fontana,Calif. K1 ... 5.125
Houston S6 ... 4.725
Johnstown,Pa. B2 ... 4.325
Joliet,Ill. A7 ... 4.325
KansasCity,Mo. S6 ... 4.66
LosAngeles B3 ... 5.125
Minneapolis,Colo. C10 ... 4.575
Monessen,Pa. P7 ... 4.325
No.Tonawanda,N.Y. B11 ... 4.325
Pittsburg,Calif. C11 ... 4.975
Portsmouth,O. P12 ... 4.525
Roebling,N.J. R5 ... 4.425
So.Chicago,Ill. R2 ... 4.325
SparrowsPoint,Md. B2 ... 4.425
Sterling,Ill. (1), N15 ... 4.325
Struthers,O. Y1 ... 4.325
Torrance,Calif. C11 ... 5.125
Worcester,Mass. A7 ... 4.625

SHEET STEEL PILING
Ind Harbor,Ind. I-2 ... 4.675
Lackawanna,N.Y. B2 ... 4.675
Munhall,Pa. U5 ... 4.675
So.Chicago,Ill. U5 ... 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.85
Aliquippa,Pa. J5 ... 3.85
Bessemer,Ala. T2 ... 3.85
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fairfield,Ala. T2 ... 3.85
Fontana,Calif. K1 ... 4.50
Gary,Ind. U5 ... 3.85
Geneva,Utah C11 ... 3.85
Houston S5 ... 4.25
Ind Harbor,Ind. I-2 ... 3.85
Johnstown,Pa. B2 ... 3.90
KansasCity,Mo. S6 ... 4.45
Lackawanna,N.Y. B2 ... 3.90
LosAngeles B3 ... 4.45
Minneapolis,Colo. C10 ... 4.30
Munhall,Pa. U5 ... 3.85
Niles,Calif.+22¢ P1 ... 4.56
Phoenixville,Pa. P4 ... *4.95*
Seattle B3 ... 4.50
So.Chicago,Ill. U5, W14 ... 3.85
So.SanFrancisco B3 ... 4.40
Torrance,Calif. C11 ... 4.45
Weirton,W.Va. W6 ... 4.10

Wide Flange
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fontana,Calif. K1 ... 5.65
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.725
Fontana,Calif. K1 ... 5.925
Gary,Ind. U5 ... 4.725
Munhall,Pa. U5 ... 4.725
So.Chicago,Ill. U5 ... 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.80
Bessemer,Ala. T2 ... 5.80
Bethlehem,Pa. B2 ... 5.80
Clairton,Pa. U5 ... 5.80
Fairfield,Ala. T2 ... 5.80
Fontana,Calif. K1 ... 6.45
Gary,Ind. U5 ... 5.80
Geneva,Utah C11 ... 5.80
Ind Harbor,Ind. I-2 ... 5.80
Ind Harbor,Ind. Y1 ... 6.30
Johnstown,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
LosAngeles B3 ... 6.35
Munhall,Pa. U5 ... 5.80
Seattle B3 ... 6.40
So.Chicago,Ill. U5 ... 5.80
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.30

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 ... 5.50
Bethlehem,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
Munhall,Pa. U5 ... 5.75
So.Chicago,Ill. U5 ... 5.75

BEARING PILES
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.95
Bessemer,Ala. T2 ... 5.95
Clairton,Pa. U5 ... 5.95
Cleveland J5, R2 ... 5.95
Conshohocken,Pa. A3 ... 6.20
Ecorse,Mich. G5 ... 6.00
Fairfield,Ala. T2 ... 5.95
Fontana,Calif.(30), K1 ... 6.65
Gary,Ind. U5 ... 5.95
Geneva,Utah C11 ... 5.95
Ind Harbor,Ind. I-2 ... 5.95
Ind Harbor,Ind. Y1 ... 6.45
Johnstown,Pa. B2 ... 5.95
Munhall,Pa. U5 ... 5.95
Pittsburg J5 ... 5.95
Seattle B3 ... 6.85
Sharon,Pa. S3 ... 5.95
So.Chicago,Ill. U5 ... 5.95
SparrowsPoint,Md. B2 ... 5.95
Warren,O. R2 ... 5.95
Youngstown Y1 ... 6.45
Youngstown U5 ... 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 5.35
Coatesville,Pa. L7 ... 5.75
Conshohocken,Pa. A3 ... 5.55
Fontana,Calif. K1 ... 6.20
Gary,Ind. U5 ... 5.25
Johnstown,Pa. B2 ... 5.25
Munhall,Pa. U5 ... 5.25
Sharon,Pa. S3 ... 5.76
So.Chicago,Ill. U5 ... 5.25
SparrowsPoint,Md. B2 ... 5.25

FLOOR PLATES
Cleveland J5 ... 4.95
Conshohocken,Pa. A3 ... 4.95
Ind Harbor,Ind. I-2 ... 4.95
Munhall,Pa. U5 ... 4.95
So.Chicago,Ill. U5 ... 4.95

PLATES, Ingot Iron
Ashland,Ky. (5), A10 ... 4.15
Cleveland J5, R2 ... 4.50
Warren,O. C17, R2 ... 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.90
Aliquippa,Pa. J5 ... 3.90
Ashland,Ky. (5), A10 ... 3.90
Bessemer,Ala. T2 ... 3.90
Clairton,Pa. U5 ... 3.90
Claymont,Del. C22 ... 4.35
Cleveland J5, R2 ... 3.90
Coatesville,Pa. L7 ... 4.35
Conshohocken,Pa. A3 ... 4.35
Ecorse,Mich. G5 ... 4.45
Fairfield,Ala. T2 ... 3.90
Fontana,Calif.(30), K1 ... 4.55
Gary,Ind. U5 ... 3.90
GraniteCity,Ill. G4 ... 4.60
Geneva,Utah C11 ... 3.90
Harrisburg,Pa. C6 ... 6.50
Houston S5 ... 4.30
Ind Harbor,Ind. I-2, Y1 ... 3.90
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Minnequa,Colo. C10 ... 4.70
Munhall,Pa. U5 ... 3.90
Pittsburgh J5 ... 3.90
Seattle B3 ... 4.80
Sharon,Pa. S3 ... 4.15
So.Chicago,Ill. U5, W14 ... 3.90
SparrowsPoint,Md. B2 ... 3.90
Steubenville,O. W10 ... 3.90
Warren,O. R2 ... 3.90
Weirton,W.Va. W6 ... 4.20
Youngstown R2, U5, Y1 ... 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.70
Geneva,Utah C11 ... 5.05

PLATES, Wrought Iron
(Add 4.7¢ to base and extras)
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.95
Aliquippa,Pa. J5 ... 3.95
Alton,Ill. L1 ... 4.50
Atlanta,Ga. A11 ... 4.50
Bessemer,Ala. T2 ... 3.95
Buffalo R2 ... 3.95
Canton,O. R2 ... 3.95
Clairton,Pa. U5 ... 3.95
Cleveland R2 ... 3.95
Detroit R7 ... 4.10
Ecorse,Mich. G5 ... 4.30
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.75
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind Harbor,Ind. I-2 Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S6 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minneapolis,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
N.Tonawanda,N.Y. B11 ... 3.95
Pittsburg,Calif. C11 ... 4.65
Pittsburg J5 ... 3.95
Seattle B3, N14 ... 4.70
So.Chicago R2,U5,W14 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFran.,Calif. B3 ... 4.70
Sterling,Ill. N15 ... 4.55
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Weirton,W.Va. W6 ... 4.10
Youngstown R2, U5 ... 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ... 3.95
Atlanta A11 ... 4.50
Niles,Calif. P1 ... 4.65
SanFrancisco S7 ... 4.90

BAR SIZE ANGLES, H.R CARBON
Bethlehem,Pa. B2 ... 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.625
Buffalo R2 ... 4.675
Canton,O. R2 ... 4.675
Canton,O. T7 ... 4.72
Clairton,Pa. U5 ... 4.675
Detroit R7 ... 4.825
Ecorse,Mich. G5 ... 5.025
Fontana,Calif. K1 ... 5.725
Gary,Ind. U5 ... 4.675
Houston S5 ... 5.075
Ind Harbor,Ind. I-2,Y1 ... 4.675
Johnstown,Pa. B2 ... 4.675
KansasCity,Mo. S6 ... 5.275
Lackawanna,N.Y. B2 ... 4.675
LosAngeles B3 ... 5.725
Massillon,O. R2 ... 4.675
Midland,Pa. C18 ... 4.675
So.Chicago R2,U5,W14 ... 4.675
So.Duquesne,Pa. U5 ... 4.675
Struthers,O. Y1 ... 4.675
Warren,O. C17 ... 4.675
Youngstown U5 ... 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.925
Gary,Ind. U5 ... 4.925
Youngstown U5 ... 4.925

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.925
Bessemer,Ala. T2 ... 5.925
Bethlehem,Pa. B2 ... 5.925
Clairton,Pa. U5 ... 5.925
Cleveland R2 ... 5.925
Ecorse,Mich. G5 ... 6.675
Fairfield,Ala. T2 ... 5.925
Fontana,Calif. K1 ... 6.975
Gary,Ind. U5 ... 5.925
Ind Harbor,Ind. I-2 ... 5.925
IndianaHarbor,Ind. Y1 ... 6.425
Johnstown,Pa. B2 ... 5.925
Lackawanna,N.Y. B2 ... 5.925
LosAngeles B3 ... 6.625
Pittsburgh J5 ... 5.925
Seattle B3 ... 6.675
So.Duquesne,Pa. U5 ... 5.925
So.SanFrancisco B3 ... 6.675
Struthers,O. Y1 ... 5.925
Youngstown U5 ... 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.925
BeaverFalls,Pa. R2 ... 4.925
BeaverFalls,Pa. M12 ... 4.925
Buffalo B5 ... 4.975
Camden,N.J. P13 ... 5.375
Carnegie,Pa. C12 ... 4.925
Chicago B5 ... 4.925
Chicago W18 ... 4.925
Cleveland A7, C20 ... 4.925
Detroit P17, R7 ... 5.025
Donora,Pa. A7 ... 4.925
Elyria,O. W8 ... 4.925
FranklinPark,Ill. N8 ... 4.925
Gary,Ind. R2 ... 4.925
GreenBay,Wis. K7 ... 4.925
Hammond,Ind. I2, M13 ... 4.925
Hartford,Conn. R2 ... 5.475
LosAngeles R2 ... 6.375
Mansfield,Mass. B6 ... 5.475
Massillon,O. R2, R8 ... 4.925
Monaca,Pa. S17 ... 4.925
Newark,N.J. W18 ... 5.375
Plymouth,Mich. P5 ... 5.175
Pittsburgh J5 ... 4.925
Putnam,Conn. W18 ... 5.475
Readville,Mass. C14 ... 5.475
St.Louis,Mo. M8 ... 5.30
So.Chicago,Ill. W14 ... 4.925
SpringCity,Pa. K3 ... 5.375
Struthers,O. Y1 ... 4.925
Waukegan,Ill. A7 ... 4.925
Youngstown Y1 ... 4.925
Youngstown F3 ... 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 6.00
BeaverFalls,Pa. M12 ... 6.00
Bethlehem,Pa. B2 ... 6.00
Buffalo B5 ... 6.00
Camden,N.J. P13 ... 6.40
Canton,O. R2 ... 6.00
Canton,O. T7 ... 5.90
Carnegie,Pa. C12 ... 6.00
Chicago B5 ... 6.00
Chicago W18 ... 6.00
Cleveland A7 ... 6.00
Cleveland C20 ... 6.00
Detroit P17, R7 ... 6.15
Donora,Pa. A7 ... 6.00
Elyria,O. W8 ... 6.00
Gary,Ind. R2 ... 6.00
Hammond,Ind. I-2, M13 ... 6.00
Hartford,Conn. R2 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Mansfield,Mass. B6 ... 6.45
Massillon,O. R2, R8 ... 6.00
Midland,Pa. C18 ... 6.00
Monaca,Pa. S17 ... 6.00
Newark,N.J. W18 ... 6.35
Plymouth,Mich. P5 ... 6.20
So.Chicago,Ill. R2, W14 ... 6.00
SpringCity,Pa. K3 ... 6.20
Struthers,O. Y1 ... 6.00
Warren,O. C17 ... 6.00
Waukegan,Ill. A7 ... 6.06
Worcester,Mass. A7 ... 6.35
Youngstown Y1 ... 6.00
Youngstown F3 ... 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.85
Atlanta A11 ... 4.50
Buffalo R2 ... 3.95
Cleveland R2 ... 3.95
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.60
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S6 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minneapolis,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
SandSprings,Okla. S6 ... 4.85
Seattle B3, N14 ... 4.70
So.Chicago,Ill. R2 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFrancisco B3 ... 4.70
SparrowsPoint,Md. B2 ... 3.95
Sterling,Ill.(4), N15 ... 4.70
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Youngstown R2, U5 ... 3.95

BARS, Reinforcing (Fabricated, to consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown, ¼-1" B2 ... 5.25
KansasCity, So. ... 6.05
LosAngeles B3 ... 5.45
Marion,O.(4) P11 ... 5.25
Seattle B3, N14 ... 5.80
SandSprings, S6 ... 6.45
So.SanFrancisco B3 ... 5.45
SparrowsPt. ¼-1" B2 ... 5.25
Williamsport,Pa. S19 ... 5.35

RAIL STEEL BARS
ChicagoHts.(3,4), C2 ... 4.75
ChicagoHts.(3,4), I-2 ... 4.75
Franklin Pa.(3,4), F5 ... 4.75
FortWorth,Tex.(26), T6 ... 5.10
Huntngt.W.Va.(3), W7 ... 5.75
Marion,O.(3,4), P11 ... 4.75
Moline,Ill.(3), B2 ... 4.90
Tonawanda(3,4), B12 ... 5.00
Williamsport(3), S19 ... 5.25
William port(3,4), S19 ... 5.35

BARS, Wrought Iron
(Add 4.7¢ to base and extras)
Economy Pa.(S.R.), B14 ... 9.60
Economy Pa.(D.R.),B14 ... 11.90
Economy,Staybolt,B14 ... 12.20
McK.Rks.(Staybolt), L5 ... 11.50
McK.Rks.(S.R.), L5 ... 9.60
McK.Rks.(D.R.), L5 ... 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.775
Ashland,Ky.(5), A10 ... 3.775
Butler,Pa. A10 ... 3.775
Cleveland J5, R2 ... 3.775
Conshohocken,Pa. A3 ... 4.125
Detroit M1 ... 4.40
Ecorse,Mich. G5 ... 3.925
Fairfield,Ala. T2 ... 3.775
Fontana,Calif. K1 ... 4.825
Gary,Ind. U5 ... 3.775
Geneva,Utah C11 ... 3.875
GraniteCity,Ill. G4 ... 4.30
Ind Harbor,Ind. I-2, Y1 ... 3.775
Irvin,Pa. U5 ... 3.775
Lackawanna,N.Y. B2 ... 3.775
Munhall,Pa. U5 ... 3.775
Niles,O. N12 ... 3.825
Pittsburg,Calif. C11 ... 4.475
Pittsburgh J5 ... 3.775
Sharon,Pa. S3 ... 4.175
So.Chicago,Ill. W14 ... 3.775
SparrowsPoint,Md. B2 ... 3.775
Steubenville,O. W10 ... 3.775
Torrance,Calif. C11 ... 4.475
Warren,O. R2 ... 3.775
Weirton,W.Va. W6 ... 3.775
WestLeechburg,Pa. A4 ... 3.925
Youngstown U5, Y1 ... 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.925
Dover,O. R1 ... 5.825
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.675
Torrance,Calif. C11 ... 5.575

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.675
Conshohocken,Pa. A3 ... 5.925
Ecorse,Mich. G5 ... 6.225
Fairfield,Ala. T2 ... 5.675
Fontana,Calif. K1 ... 6.775
Gary,Ind. U5 ... 5.675
Ind Harbor,Ind. I-2 ... 5.675
Ind Harbor,Ind. Y1 ... 6.175
Irvin,Pa. U5 ... 5.675
Lackawanna(3), B2 ... 5.675
Munhall,Pa. U5 ... 5.675
Pittsburgh J5 ... 5.675
Sharon,Pa. S3 ... 5.675
So.Chicago,Ill. U5 ... 5.675
SparrowsPoint(36), B2 ... 5.675
Warren,O. R2 ... 5.675
Weirton,W.Va. W6 ... 6.025
Youngstown U5 ... 5.675
Youngstown Y1 ... 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.925
Ecorse,Mich. G5 ... 7.425
Fontana,Calif. K1 ... 7.875
Gary,Ind. U5 ... 6.925
IndianaHarbor,Ind. Y1 ... 7.425
IndianaHarbor,Ind. I-2 ... 6.925
Irvin,Pa. U5 ... 6.925
Lackawanna(37), B2 ... 6.925
Pittsburgh J5 ... 6.925
SparrowsPoint(38), B2 ... 6.925
Warren,O. R2 ... 6.925
Weirton,W.Va. W6 ... 7.275
Youngstown Y1 ... 7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland,J5, R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.575
GraniteCity,Ill. G4	5.275
Ind Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh, J5	4.575
Sparrows Point,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	4.575
WestLeechburg,Pa. A4	5.45
Youngstown,Y1	4.575

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	5.075
Ashland,Ky.(8), A10	5.074
Canton,O. R2	5.075
Delphos,O. N16	5.674
Dover,O. R1	5.774
Fairfield,Ala. T2	5.675
Gary,Ind. U5	5.074
GraniteCity,Ill. G4	5.50
Ind Harbor,Ind. I-2	5.074
Irvin,Pa. U5	5.075
Kokomo,Ind.(13), C16	5.475
MartinsFerry,O. W10	5.074
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.525
SparrowsPoint,Md. B2	5.074
Steubenville,O. W10	5.074
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.074

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(39), B2	7.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13), C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland,R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1	5.31

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee,(23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8), A10	4.925
Cleveland,R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown,Y1	4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.50
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

SHEETS, Culvert-18 Gage and Heavier

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.80	
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind Harbor,Ind. I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	
MartinsFy.,O. W10	5.875	
Pittsburg,Cal. C11	6.625	
SparrowsPt. B2	5.875	
Torrance,Cal. C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8), A10	4.025
Cleveland,R2	4.375
Ind Harbor,Ind. I-2	4.025
Warren,O. R2	4.775

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland,R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.475

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8), A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	$.425

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.Cal. C11	9.45	9.70
Sp.Pt. Md. B2	8.80	9.05
Warren,O. R2	8.70	
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	7.75	8.00	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R. (22 Ga.) COILS (Cut lengths 1/2c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10 (cut lengths)			7.85	9.10	9.90
Brackenridge,Pa. A4			8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)			8.55	9.80	
IndianaHarbor,Ind. I-2	7.55	7.85	(41)	(41)	
Mansfield,O. E6 (cut lengths)	7.20	7.55	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85		
Vandergrift,Pa. U5		7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10		7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom,W.Va. W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95			
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95			
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)			15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 6 lb (Commercial Quality)

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.60
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25), B3	6.10
Seattle(25), B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25), B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown,Y1	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland,J5	7.45
Cleveland,A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.50
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown,Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27), R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8), A10	3.725
Atlanta,Ill. A11	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Conn.(10)	S15 4.225
Buffalo(27), R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit,M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	5.175
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25), B2	3.725
KansasCity,Mo.(9), S3	4.325
Lackawanna,N.Y.(32)	R2 3.725
LosAngeles(25), B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain,Conn.(10)	S15 4.225
N.Tonawanda,N.Y.	B11 3.725
Pittsburg,Calif.	C11 4.475
Riverdale,Ill.	A1 3.725
SanFrancisco	S7 5.00
Seattle(25),	B3 4.725
Seattle	N14 4.75
Sharon,Pa.	S3 4.225
So.Chicago,Ill.	W14 3.725
So.SanFrancisco(25),	B3 4.475
SparrowsPoint,Md.	B2 3.725
Sterling,Ill.	N15 4.725
Torrance,Calif.	C11 4.475
Warren,O.	R2 3.725
Weirton,W.Va.	W6 3.825
WestLeechburg,Pa.	A4 3.975
Youngstown	U5, Y1 3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10),	S15 6.05
Carnegie,Pa.	S18 6.45
Fontana,Calif.	K1 7.30
Gary,Ind.	U5 6.10
Houston,Tex.	S5 6.50
KansasCity,Mo.	S5 6.70
Midland,Pa.	C18 5.85
NewBritn.,Conn.(10),	S15 6.05
Sharon,Pa.	S3 6.45
Youngstown	U5 6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40),	G6 5.50
Bridgeprt,Conn.(10),	S15 5.80
Butler,Pa.	A10 5.10
Cleveland,A7,	J5 5.10
Dearborn,Mich.	D3 6.05
Detroit	D2 5.60
Detroit	M1 5.45
Dover,O.(40),	G6 5.50
Ecorse,Mich.	G5 5.30
Follansbee,W.Va.	F4 5.10
Fontana,Calif.	K1 6.75
Franklin Park,Ill.(40),	T6 5.45
Ind Harbor,Ind.	I-2 5.35
Lackawanna,N.Y.	B2 5.10
LosAngeles	C1 6.85
Mattapan,Mass.	T6 5.95
Middletown,O.	A10 5.10
NewBritain,(10),	S15 5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		6.50	7.40	9.35	11.65
Bridgeport,Conn.(10)	S14 5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1			8.55	10.50	
Carnegie,Pa. S18		7.65	8.25	10.20	12.50
Cleveland,A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50		
Detroit D2	6.45	7.50	8.10		
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
Franklin Park,Ill. T6	5.45	7.45	8.10	10.35	12.65
Harrison,N.J. C18			8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10)	S15 5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20		
New York,W3		7.85	8.55	10.50	12.80
Pawtucket,R.I. N8, Cleve.or Pitts.Base		7.65	8.25	10.20	12.50
Worcester,Mass.Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5		7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.45
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	6.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8		7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5	(29)		10.30	12.50	15.35
Harrison,N.J. C18			10.30	12.50	15.35
New York,W3			10.30*	12.50*	15.35*
Youngstown C8			10.30	12.50	15.35

* Plus 1.57c per 100 lb.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8), A10	5.925
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta,Ill. A11	4.45
Riverdale,Ill. A1	4.30
Sharon,Pa. S3	4.55
Youngstown,U5	4.15

NewCastle,Pa. B4	5.80
NewCastle,Pa.(40), E5	5.70
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. R3	6.45
Pawtucket,R.I.(21), N8	6.30
Riverdale,Ill.(40), A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.30
Warren,O.(40), T5	5.70
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8 (40),	5.70
Youngstown Y1	5.10

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10),	S15 12.15
Carnegie,Pa.	S18 12.00
Cleveland,A7	11.40
Dover,O. G6	11.90
Fontana,Calif.	K1 13.65
Harrison,N.J.	C18 12.00
Midland,Pa.	C18 12.00
NewBritn.,Conn.(10),	S15 12.15
Pawtucket,R.I.(11),	N8 12.15
Pawtucket,R.I.(12),	N8 12.15
Sharon,Pa.	S3 12.00
Worcester,Mass.	A7 11.70
Youngstown	C8 12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8),	A10 5.925
Warren,O.	R2 4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O.	R2 5.70

TIGHT COOPERAGE HOOP

Atlanta,Ill.	A11 4.45
Riverdale,Ill.	A1 4.30
Sharon,Pa.	S3 4.55
Youngstown,U5	4.15

Key to Producers

A1 Acme Steel Co.	C10 Colorado Fuel & Iron
A3 Allenwood Steel Co.	C11 Columbia-Geneva Steel
A4 Allegheny Ludlum Steel	C12 Columbia Steel & Shaft
A7 American Steel & Wire	C13 Columbia Tool Steel Co.
A8 Anchor Drawn Steel Co.	C14 Compressed Steel Shaft
A9 Angell Nail & Chaplet	C16 Continental Steel Corp.
A10 Armco Steel Corp.	C17 Copperweld Steel Co.
A11 Atlantic Steel Co.	C18 Crucible Steel Co.
A13 American Cladmetals Co.	C19 Cumberland Steel Co.
B1 Babcock & Wilcox Co.	C20 Cuyahoga Steel & Wire
B2 Bethlehem Steel Co.	C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
B3 Beth. Pac. Coast Steel	D2 Detroit Steel Corp.
B4 Blair Strip Steel Co.	D3 Detroit Tube & Steel
B5 Bliss & Laughlin Inc.	D4 Disston & Sons, Henry
B6 Bourdi Steel Corp.	D6 Driver Harris Co.
B8 Braeburn Alloy Steel	D7 Dickson Weatherproof Nail Co.
B11 Buffalo Bolt Co.	E1 Eastern Gas&Fuel Assoc.
B12 Buffalo Steel Div. H. K. Porter Co.	E2 Eastern Stainless Steel
B14 A. M. Byers Co.	E4 Electro Metallurgical Co.
C1 Calstrip Steel Corp.	E5 Elliott Bros. Steel Co.
C2 Calumet Steel Div. Borg-Warner Corp.	E6 Empire Steel Corp.
C4 Carpenter Steel Co.	F2 Firth Sterling Inc.
C5 Central Iron & Steel Div. Barium Steel Corp.	F3 Fitzsimons Steel Co.
C7 Cleve. Cold Rolling Mills	F4 Follansbee Steel Corp.
C8 Cold Metal Products Co.	F5 Franklin Steel Div. Borg-Warner Corp.
C9 Colonial Steel Co.	F6 Fretz-Moon Tube Co.
	F7 Ft. Howard Steel & Wire
	G2 Globe Iron Co.
	G3 Globe Steel Tubes Co.
	G4 Granite City Steel Co.
	G5 Great Lakes Steel Corp.
	G6 Greer Steel Co.
	H1 Hanna Furnace Corp.
	I-1 Ingot Iron Co.
	I-2 Inland Steel Co.
	I-3 Interlake Iron Corp.
	I-4 Ingersoll Steel Div. Borg-Warner Corp.
	I-7 Indiana Steel & Wire Co.
	J1 Jackson Iron & Steel Co.
	J3 Jessop Steel Co.
	J4 Johnson Steel & Wire Co.
	J5 Jones & Laughlin Steel
	J6 Joslyn Mfg. & Supply
	J7 Judson Steel Corp.
	J8 Jersey Shore Steel Co.
	K1 Kaiser Steel Corp.
	K2 Keokuk Electro-Metals
	K3 Keystone Drawn Steel
	K4 Keystone Steel & Wire
	L1 Laclede Steel Co.
	L2 LaSalle Steel Co.
	L3 Latrobe Steel Co.
	L6 Lockhart Iron & Steel
	L6 Lone Star Steel Co.
	L7 Lukens Steel Co.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld. Galv.
AlabamaCity R2	6.075 6.325
Aliquippa Jo	6.075 6.525‡
Atlanta A11	6.325 6.675
Bartonville Ro K4	6.075 6.40
Buffalo W12	5.225
Cleveland A7	6.075 6.225
CrawfordsvilleMs	6.175 6.475
Donora,Pa. A7	6.075 6.225
Duluth,Minn. A7	6.075 6.225
Fairfield T2	6.075 6.225
Houston,Tex. S5	6.475 6.80
Johnstown B2	6.075 6.45‡
Joliet,Ill. A7	6.075 6.225
KansasCy,Mo. S5	6.075 7.00
Kokomo C16	6.175 6.425
LosAngeles B3	7.025
Minnequa C10	6.325 6.40‡
Monessen P7	6.075 6.45
Palmer W12	5.525
Pitts. Calif. C11	7.025 7.175
Prtsmth.O.S10/P12	6.475
Rankin A7	6.075 6.225
So.Chicago R2	6.075 6.325
So.S.Fran. C10	7.025 7.40‡
SparrowsPt. B2	6.175 6.50
Sterling,Ill.C1/N15	6.075 6.525
Struthers,O. Y1	6.075 6.475
Torrance,Cal. C11	7.025
Worcester,A7	6.375 6.625

‡Based on 16c zinc; $14.50c zinc, $17.5 zinc.

WIRE (16 gage)	Ann'ld. Galv. Stone	Stone
(Add 1.c.w. on base and extras)		
Aliquippa Jo	10.15	12.15
BartonvilleIro K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfrdsville Ms	10.75	12.51
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.75	12.585
Kokomo C16	10.625	12.325‡
Minnequa C10	10.10	12.425*
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	11.30
SparrowsPt. B2	10.85	12.685
Sterling(I) N15	10.75	12.15
Waukegan A7	10.25	11.55
Worcester A7		11.85

‡Based on 16c zinc; $14.50c zinc. Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. Jo (42)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K1	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. Ms	5.525
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O. (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6.8 ga. I-1	5.85
No.Tonawanda B11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	6.175
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawfordsville Ind.Ms (43)	5.70
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
FranklinPark,Ill. T6 (43)	6.20
Massillon,O. R8 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt.R.I.(12) Ns (43)	6.35
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7 (43)	6.15
Worcester,Mass. T6 (43)	6.50
Worcester,Mass.W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
Sparrowspt.,Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

ROPE WIRE

Alton,Ill. L1 (43)	8.75
Bartonville,Ill. K4	8.90
Buffalo W12 (43)	8.65
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester,Ja. T6 (43)	8.85

(A) Plow and Mild Plow; add 0.2c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. Jo (43)	6.25
Alton,Ill. L1 (43)	6.00
Bartonville,Ill. K4	6.60
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Millbury,(12) N6 (43)	8.95
Minnequa,Colo. C10(43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.25
Palmer,Mass. W12(43)	6.50
Pittsburg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	6.35
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
Struthers,O. Y1 (43)	6.25
SparrowsPt.,Md. B2 (43)	6.35
Trenton,N.J. A7 (43)	6.35
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.60
Worcester Mass. W12(43)	6.50
Worcester,Mass. J4 (43)	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. Jo	6.275
Alton,Ill. L1	6.40
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
LosAngeles B3	7.225
Minnequa,Col. C10	6.350
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.375
Palmer,Mass. W12	6.375
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.375
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.275
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.275

WIRE, Fine & Weaving (8 Coils)

Alton,Ill. L1 (43)	9.20
Bartonville,Ill. K4	8.90
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawf'sville,Ind. Ms(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12	8.675
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worcstr,Mass. A7,T6(43)	9.20

WIRE, Tire Bead

Bartonville,Ill. K4	11.50
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.50

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	135
Ala.City,Ala. 17-19ga.R2	222
Aliquippa,Pa.9-11½ ga.Jo	139‡
Atlanta A11	146
Bartonville,Ill.(16) K4	137
Crawford-sville,Ind. Ms	138
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	142
Johnstown,Pa. B2	135‡
Johnstown 17ga. 6" B2	222‡
Joliet,Ill. A7	133
KansasCity,Mo. S5	140
Kokomo,Ind. C16	140
Minnequa,Colo. C10	140*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill. (1) N15	136

‡Based on 16c zinc; 17.5c zinc.

FENCE POSTS

	Col.
Chicago Hts.,Ill. C2	110
Duluth,Minn. A7	133
Franklin,Pa. F6	115
Huntington,W.Va. W7	118
Johnstown,Pa. B2	118
Marion,O. P11	110
Minnequa,Colo. C10	135
Moline,Ill. R2	136
So.Chicago,Ill. R2	110
Tonawanda,N.Y. B12	118
Williamsport,Pa. S19	158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	111
Aliquippa,Pa. Jo	118
Atlanta A11	110
Bartonville,Ill.(16) K4	116
Crawfordsville,Ind. Ms	117
Donora,Pa. A7	112
Duluth,Minn. A7	112
Fairfield,Ala. T2	112
Houston,Tex. S5	134
Johnstown,Pa. B2	114
Joliet,Ill. A7	112
KansasCity,Mo. S5	134
Kokomo,Ind. C16	114
Minnequa,Colo. C10	114
Pittsburg,Calif. C11	136
So.Chicago,Ill. R2	112
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	117
Sterling,Ill.(1) N15	115

*Based on 16c zinc; 17.5c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(16) K4	132
Crawfordsville,Ind. Ms	132
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa. (33) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh (3), P11	9.85

AXLES

Ind.Harbor,Ind. SH3	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. Jo	127
Atlanta A11	130
Bartonville,Ill.(16) K4	127
Chicago,Ill. W13	127
Cleveland A5 (44)	125
Crawfordsville,Ind. Ms	127
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. I7	135
Houston,Tex. S5	135
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5	139
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	147
Sterling,Ill.(1) N15	145

*Based on 16c zinc; 17.5c zinc.

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind.Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$66.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

* Per net ton

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind.Harbor,Ind. I-2	4.925
Joliet,Ill. U5	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Yd	6.65
KansasCity,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh,Pa.	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown,O. R2	6.65

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	Std. Tee Rails 60 lb. Under
Bessemer,Pa. U5	3.725	3.675	3.725	4.25
Ensley,Ala. T2	3.725	3.675		4.25
Fairfield,Ala. T2				4.25
Gary,Ind. U5	3.725	3.675	3.725	
Huntington,W.Va. W7				5.25
IndianaHarbor,Ind. I-2	3.725	3.675	3.725	
Johnstown,Pa. B2				4.25
Lackawanna,N.Y. B2	3.725	3.675		4.25
Minnequa,Colo. C10	$76.50*	$75.50*		4.25
Steelton,Pa. B2	3.725	3.675		
Williamsport,Pa. S19				5.00

* Per net ton

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.220
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.530
Hi Carbon Cr	0.65

Grade by Analysis

W	Cr	V	Co	
18	4	1		1.05
18	4	2		1.65-1.95
20 25	4 2.5	1.6	12 25	3.55-3.625
18	4	2	7	2.460
18 25	4 25	1	4.75	2.125
18	4	2	9	2.44-2.84
13.5	4	3		1.6025
6	3.25	0.6		1.01

W	Cr	V	Mo	
6 4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include A4, A8, B2, B8, I4, C6, C13, C18, I4, F2, J3, L3, M15, S8, V4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Chicago or Birm. base.
(7) To jobbers, 2 cents lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. Base.
(13) Add 0.5c for 12 ga. & heavier.
(14) 5/8" and thinner.
(15) 16 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.2c off for untreated.
(21) New Haven, Conn. base.
(22) Incl. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Bethlehem 0.2c, Inter. than 0.3c.
(25) Bar mill hand.
(26) Reinforcing mill, billet, to fabricators or engineers, 7.85c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $1.50 per ton.
(30) Sheared, add 0.25c for universal mill.
(31) Not annealed.
(32) 1/4" or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 1/2" and narrower.
(36) 1/4" and narrower.
(37) 1/2" gage & lighter, 60" & narrower.
(38) 1/4" gage & lighter 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.0225", 0.025" and heavier, 0.2c higher.
(41) 3/16" for cut lengths.
(42) Plus 0.25c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 15c per 100 lb.
(45) Plus 10c per 100 lb.
(46) Plus 2.2 per cent.

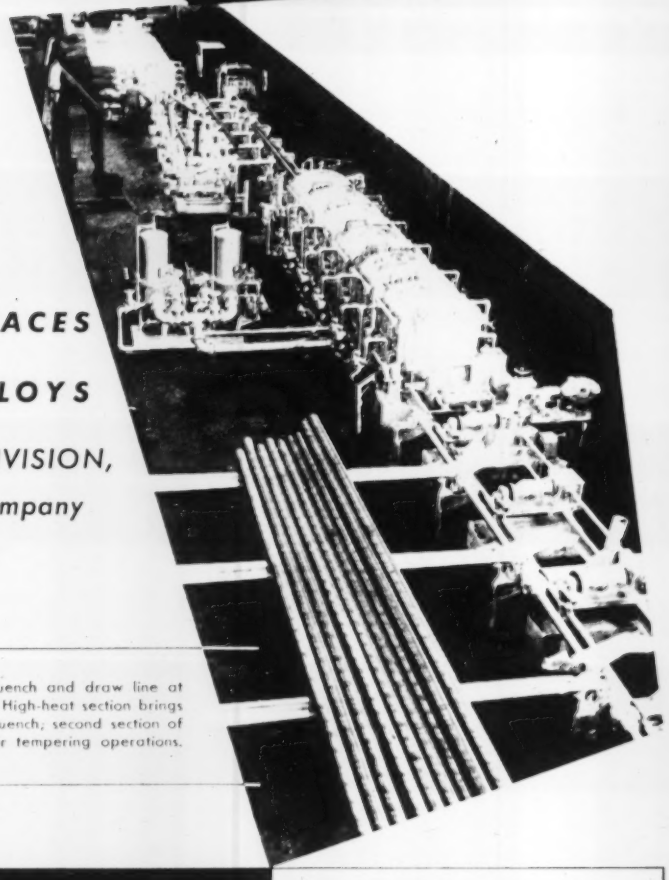
Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Medart Co.
M9 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Metrop.Steel Products
M13 Monarch Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N4 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P8 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S12 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

GAS... THE MODERN FUEL FOR ALL INDUSTRY

GAS FIRED FURNACES CONSERVE CRITICAL ALLOYS

at SPANG-CHALFANT DIVISION, The National Supply Company



Continuous Gas-fired heat-treating quench and draw line at Spang-Chalfant plant, Ambridge, Pa. High-heat section brings tubing to temperature required for quench; second section of Gas-fired furnaces performs draw, or tempering operations.

- *In production of more than 80,000 tons of deep oil-well casing, critical alloys have been saved as follows:*
- *over 300,000 pounds molybdenum*
- *almost 1,500,000 pounds manganese*

PHYSICAL PROPERTIES FOR N-80 CASING	
MINIMUM YIELD STRENGTH	80,000 PSI.
MINIMUM ULT. TENSILE ST.	100,000 PSI.
MINIMUM ELONG. IN 2"	16%

ANALYSIS OF STEEL BEING USED	
CARBON	0.30 TO 0.40
MANGANESE	0.60 TO 0.90
PHOSPHOROUS	0.04 MAX
SULFUR	0.05 MAX
SILICON	0.25 MAX

For five years, plain carbon steel has been used at Spang-Chalfant Division of The National Supply Co. to make deep oil-well casing, grade N-80. Usually this casing is made with normalized-and-drawn high Mn-Moly steel. This new process gives the necessary characteristics to the casing by means of continuous Gas-fired heat-treating quench and draw line.

MORE AND MORE THE TREND IS TO GAS FOR INDUSTRIAL PROCESSING

Physical properties of the steel show it to be at least equal to the high Mn-Moly casing formerly made.

The heating units, designed by Selas Corporation of America, are composed of twelve radiant Gas-fired furnaces, divided into two sections of six furnaces each. First section brings pipe to quenching temperature of about 1600° F. Second section maintains temperatures of 1050 to 1250° F, depending upon the metallurgical structure of the pipe. Other equipment includes eight carburetors which deliver pre-mixed fuel under pressure to burners, automatic temperature control and recording devices, annular orifice quench head with pumping and filtering equipment.

Two rows of Gas burners on each side of these furnaces permit extremely fast heating. Ceramic burner tips can be replaced while the furnace is operating.

Gas is Industry's modern, efficient fuel. Wherever you need Heat, you need Gas. Get the facts from your Gas Company Representative.

AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE • NEW YORK 17, NEW YORK

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	½	¾	1	1¼	1½	2	2½	3
List Per Ft.	8.5c	11.5c	17c	23c	27.5c	37c	58.5c	76.5c
Pounds Per Ft.	0.85	1.13	1.68	2.28	2.73	3.68	5.82	7.62

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25
Alton, Ill. L1 (†)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75
Fontana, Calif. K1 (†)	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75
Ind. Harbor, Ind. Y1 (†)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75
Youngstown R2 (**)	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2	2½	3	3½	4	5	6
List Per Ft.	37c	58.5c	76.5c	92c	$1.09	$1.48	$1.92
Pounds Per Ft.	3.68	5.82	7.62	9.20	10.89	14.81	19.18

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5(‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (**)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	¼	½	¾	1	3½	4
List Per Ft.	5.5c	6c	6c	92c	$1.09	
Pounds Per Ft.	0.24	0.42	0.57	9.20	10.89	

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+ 0.25	23.25	+ 3.5	17.75	+ 7.75	33	14.25	33	14.25
Butler, Pa. F6 (†)	30.5	1.25	25	+ 1.75	20	+ 5.5	..	.....	..	.....
Etna, Pa. N2 (†)	30.5	1.25	25	+ 1.75	20	+ 5.5	33	14.25	33	14.25
Sharon, Pa. M6 (‡)	29.5	— 1.75	23	+ 2.25	18	+ 5.25	..	.....	..	.....
Sharon, Pa. S4 (†)	30.5	1.25	25	+ 1.75	20	+ 5.5	..	.....	..	.....
Sparrows Pt., Md. B2	28.5	+ 0.75	23	+ 3.75	18	+ 7.50	..	.....	..	.....
Youngstown R2 (**)	..	.....	..	.....	..	.....	33	15.75	33	15.75
Wheatland, Pa. W9	28.5	+ 0.75	23	+ 3.75	18	+ 7.50	..	.....	..	.....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (**), 11.50c; (*), 9c, with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.71-17.77	16.20	16.20
1¼	13	16.97	19.80-21.26	16.46	19.19
1½	13	18.22-18.77	22.08-22.82	18.19	21.41
1¾	13	20.35-21.35	24.92-25.49	20.69	24.35
2	13	22.81-23.93	27.94-28.58	23.19	27.28
2¼	13	25.69-26.66	31.38-32.18	25.84	30.42
2½	12	28.40-29.36	34.55-35.58	28.46	33.50
2½	12	31.28-32.17	37.85-39.16	31.19	36.67
2¾	12	33.87-34.82	40.99-42.44	33.06	38.86
3	12	35.78-36.87	42.11-44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap and Sleigh Shoe 21
Tire Bolts 21
Boiler & Fitting-Up Bolts 31

NUTS

	Reg. Hvy.
H.P. & C.P. Square:	
½-in. & smaller	15 15
⅝-in. & ¾-in.	12 6.5
⅞-in.-1½-in.	9 1
1⅝-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	16.5 6.5
⅞-in.-1½-in.	12 2
1⅝-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	23 17.5
⅞-in. & 1½-in.	19.5 12
1⅝-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
		Light
⅞-in. & smaller		35
½-in. to ⅝-in.		28.5
¾-in. to 1½-in.		26

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger 16
N.F. thread, all diams. 10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish 48 & 10
Plated finishes 31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. 34

Longer than 6 in.:
- ⅝-in. and smaller 26
- ¾-in. through 1 in. 4

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c
½-in. under 36 off

ELECTRODES

(Threaded; with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17 to 20	60-72	17.85
8 to 16	48-60-72	17.85
7	48-60	19.57
6	48-60	20.95

CARBON

35-40	110	8.03
30	65-84-110	8.03
24	72 to 104	8.03
17 to 20	84-90	8.03

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvill fur. $14.50-15.00
Connellsvill fdy. 16.50-17.50
New River foundry 20.50
Wise county, foundry 15.95
Wise county, furnace 15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens $24.00
Everett, Mass., ovens
- New England, del. *26.05

Chicago ovens 24.50
Chicago, del. 26.00
Terre Haute, ovens 24.05
Milwaukee, ovens 25.25
Indianapolis, ovens 24.25
- Chicago, del. 28.12
- Cincinnati, del. 25.85

Painesville, O., ovens 25.50
- Cleveland, del. 27.43

Erie, Pa., ovens 25.00
Birmingham, ovens 21.65
- Cincinnati, del. 26.58

LoneStar, Tex., ovens 18.50
Philadelphia, ovens 23.95
Swedeland, Pa., ovens 23.85
St. Louis, ovens
- St. Louis, del. 26.00

Portsmouth, O., ovens 24.00
- Cincinnati, del. 26.62

Detroit, ovens 25.50
- Detroit, del. 26.50
- Buffalo, del. 28.08
- Flint, del. 28.23
- Pontiac, del. 27.06
- Saginaw, del. 28.58

*Or within $4.55 freight zone from works.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-33.00
Toluol, one deg. 30.00-33.00
Industrial xylol 30.00-33.50

Per ton, bulk, ovens
Sulphate of ammonia $44-45
Cents per pound, ovens
Phenol, 40 crystals, non-returnable drums 17.25

FLUORSPAR

Metallurgical grade f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60% $40.
Imported net ton, duty paid, metallurgical grade, $33-$35.

NOTE: Current prices on clad steels appeared on page 145, Feb. 16 issue.

STAINLESS STEEL

(Add 3.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.
Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa. sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.
Cleveland, strip A7.
Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 39.50c, 410; 31.00c, 430.
Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip and wire C18.
Harrison, N. J., wire Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.2% increase on base price.
Massillon, O., all items, R2.
McKeesport, Pa., strip, Type 416; bars & wire, Types 410 through 430 and 31.25c on Type 502, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.
McKeesport, Pa., bars, sheets except Type 416 U5.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Muncie, Ind., wire 1-7 quotes types 302, 304, 420.
Pittsburgh, sheets C18.
Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars except 31.50c on Type 301 and 45.25c on 309 C4.
Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip W2 quotes 0.25c higher.
Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00c, strip 64.00c W4.
Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.
Youngstown strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	10.90
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.8-99.8% size 5 to 10 microns	$3.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	31.00-34.25
Bronze, 10-ton lots	51.25-60.00
Phosphor Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	35.25
Lead	7.50*
Magnesium	75.00-85.00
Manganese	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	46.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	83.00
Zinc, 10-ton lots	18.00-31.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum: 99.9% minus 200 mesh	3.24
Chromium, electrolytic 98% Cr min.	3.50

* Plus cost of metal

"she might have been my kid..."

"There was no time to stop, see? She comes running out from behind this parked car right under my wheels. Her hair is in pigtails, and with the sun shining on it, she might have been *my* kid. We got her to the hospital. It took 3 pints of blood to bring her around. All I have to do is remember the sound of those screaming tires—and I know why *I'm* giving blood."

Yes, all kinds of people give blood—truck drivers, office workers, salesmen. And—for all kinds of reasons. But whatever *your* reason, this you can be sure of: Whether your blood goes to a local hospital, a combat area or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives! ✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed your employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal 10 Ga.†	H.R.*	C.R.*	H.R. Rds	C.F. Rds ‡	H.R. Alloy 4140††		Carbon	Floor
Baltimore	5.81	7.17	8.37	6.42	...	6.41	7.42	11.17	6.47	6.47	7.70
Boston	6.51	7.36	8.54	6.55	...	6.42	7.48	11.18	6.56	6.75	7.98
Buffalo	5.80	6.65	8.41	6.21	...	5.90	6.95	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70[2]	5.80	...	5.80	8.65	...	5.95	6.10	8.65
Chicago	5.80	6.65	8.00	5.83	...	5.83	6.80	10.65	5.95	5.95	7.18
Cincinnati	6.13	6.72	8.47	6.14	...	6.13	7.16	11.07	6.42	6.47	7.60
Cleveland	5.80	6.65	8.14	6.00	...	5.89	6.90	10.75	6.28	6.12	7.51
Detroit	6.07	6.87	8.64	6.13	7.70	6.12	7.10	10.92	6.42	6.47	7.52
Houston	6.74	...	8.72	6.85	...	6.98	...	...	6.82	6.78	8.16
Jersey City, N.J.	6.35	7.27	8.47	6.75	...	6.59	7.78	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	9.60	6.75	11.20	6.60	8.60	12.05	6.60	6.65	8.90
Milwaukee	5.97	6.82	8.17	6.00	...	6.00	7.07	10.82	6.12	6.12	7.35
Moline, Ill.	6.16	7.00	8.35	6.19	...	6.18	7.16	...	6.30	6.30	...
Newark, N. J.	6.62	7.41	8.63	6.72	...	6.79	7.71	...	6.78	6.78	7.18
New York	6.26	7.27	8.42	6.56	...	6.59	7.53	11.04	6.39	6.60	8.01
Norfolk, Va.	7.60	...	...	...	...	6.44	8.70	...	7.25	6.64	7.33
Philadelphia	6.11	7.13	8.36	6.45	8.30	6.42	7.45	10.79	6.17	6.24	7.36
Pittsburgh	5.80	6.65	8.00	5.94	...	5.83	6.90	10.65	5.95	5.95	7.18
Portland, Oreg.	7.86	9.05	10.00	7.60	...	7.35	9.65	...	7.30	7.30	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.63	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.30	6.14	...	6.13	7.20	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.66	6.50	...	6.49	7.57	...	6.61	6.61	7.84
San Francisco	6.90	8.20	9.60	6.75	...	6.65	8.65	12.05	6.50	6.75	8.90
Seattle-Tacoma	7.36	9.04	9.70	7.95	...	7.13	9.62	11.90§	6.87	7.30	9.11
Spokane (city)	7.80	9.40	10.70	7.85	...	7.10	9.70	11.90	7.60	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.03	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras except Birmingham (coating extra excluded); and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities: 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2] 500 to 1999 lb; [3] 1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports.

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid.

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-$42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom.

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l., packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered, Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.60c per lb of contained Cr, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered, Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr. 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb of contained Cr. C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained silicon plus 16.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max 0.50% C grade, $1.12 per lb of contained chromium; ton lot $1.14, less ton $1.16. Delivered. Spot, add 5c; prices on 0.10 per cent carbon grade up to

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.85 per lb of contained W; 2000 lb W to 10,000 lb W, $4.95; less than 2000 lb W, $5.07, f.o.b. Niagara Falls, N. Y.

* Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

NOTE: Current prices on manganese, titanium and "other ferroalloys" appeared on page 147 Feb. 16 issue; calcium, zirconium, briquetted alloys and refractories, page 115, Jan. 26.

IRON AND STEEL SCRAP

Open market prices as reported to STEEL, Feb. 19, 1953, gross tons, except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Feb. 19	$43.00
Feb. 12	43.00
Jan. 1953	43.00
Feb., 1952	43.00
Feb., 1948	40.18

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Including brokers' commission)

No. 1 heavy melting	44.00
No. 2 heavy melting	44.00
No. 1 bundles	44.00
No. 2 bundles	44.00
No. 1 busheling	44.00
Machine shop turnings	34.00
Mixed borings, turnings	29.00
Short shovel turnings	38.00
Cast iron borings	41.00-42.00
Cut structurals	49.00-51.00
Heavy turnings	44.00
Punchings & plate scrap	47.50
Electric furnace bundles	46.00

Cast Iron Grades

(Delivered)

No. 1 cupola	47.00-49.00
Charging box cast	48.00
Stove plate	47.00
Heavy breakable cast	45.00
Unstripped motor blocks	43.00-44.00
No. 1 machinery cast	51.00-52.00

Railroad Scrap

No. 1 RR. heavy melt	47.00
Rails, 2 ft. and under	53.00
Rails, 18 in. and under	54.00
Rails, random lengths	49.00

CLEVELAND

(Including broker's commission)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
No. 1 busheling	44.00
Machine shop turnings	31.00-36.00
Mixed borings, turnings	34.00-36.00
Short shovel turnings	34.00-36.00
Cast iron borings	34.00-36.00
Low phos.	49.00
Heavy turnings	42.00
Electric furnace bundles	45.00

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor block	43.00
Brake shoes	44.00
Clean auto cast	52.00
No. 1 Wheels	47.00
Burnt cast	44.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 RR. heavy melt	45.00
R. R. Malleable	55.00
Rails, 3 ft. and under	50.00
Rails, 18 in. and under	53.00
Rails, random lengths	47.00
Cast steel	48.00
Railroad specialties	45.00
Uncut tires	47.00
Angles, splice bars	50.00
Rails, rerolling	52.00

YOUNGSTOWN

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Short shovel turnings	38.00
Cast iron borings	38.00
Punchings & plate scrap	46.50
Electric furnace bundles	46.00

Railroad Scrap

No. 1 RR. heavy melt	46.00

NEW YORK

(Brokers' Buying Prices)

No. 2 heavy melting	35.00
Machine shop turnings	25.00
Mixed borings, turnings	28.00

Cast Iron Grades

No. 1 cupola	40.00
Unstripped motor blocks	32.00-33.00

PHILADELPHIA

No. 1 heavy melting	41.50
No. 2 heavy melting	41.50
No. 1 bundles	42.50
No. 2 bundles	41.50
No. 1 busheling	42.50
Machine shop turnings	32.50
Mixed borings, turnings	36.50
Short shovel turnings	36.50

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	45.00-46.00
Heavy breakable cast	45.00*
Unstripped motor blocks	29.00*
Drop broken machinery	52.00*

(Delivered *Shipping point)

CINCINNATI

No. 1 heavy melting	42.00
No. 2 heavy melting	42.00
No. 1 bundles	43.00
No. 2 bundles	42.00
No. 1 busheling	43.00
Machine shop turnings	33.00
Mixed borings, turnings	37.00
Short shovel turnings	37.00
Cast iron borings	37.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	48.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	43.00
Brake shoes	44.00
Clean auto cast	52.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 RR. heavy melt	45.00
Malleable	55.00
Rails, 18 in. and under	53.00
Rails, random lengths	47.00
Rails, rerolling	52.00

DETROIT

No. 1 heavy melting	39.20-40.00
No. 2 heavy melting	39.00-39.20
No. 1 bundles	40.00-40.20
No. 2 bundles	37.00-39.20
No. 1 busheling	40.00-40.20
Machine shop turnings	26.50-30.00
Mixed borings, turnings	28.30-31.50
Short shovel turnings	28.30-31.50
Bar crops & plate	45.20-46.20
Sheet clips	34.00-35.00
Punchings & plate scrap	48.00

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	41.00-42.00
Stove plate	45.00
Unstripped motor blocks	33.00-37.50
Clean auto cast	50.00
Burnt cast	35.00-38.00
Drop broken machinery	52.00
Malleable	48.00

BUFFALO

No. 1 heavy melting	42.50-43.00
No. 2 heavy melting	41.50-42.00
No. 2 bundles	41.00-42.00
No. 1 bundles	42.50-43.00
No. 1 busheling	42.50-43.00
Machine shop turnings	32.50-33.00
Mixed borings, turnings	36.50-37.00
Short shovel turnings	36.50-37.00
Low phos.	48.50-49.00

Cast Iron Grades

(F.o.b. Shipping Points)

No. 1 cupola	42.50-43.00
Drop broken machinery	45.50-46.00

BOSTON

(Brokers' Buying Prices, f.o.b. shipping points)

No. 1 heavy melting	33.17
No. 2 heavy melting	33.17
No. 1 bundles	33.17
No. 2 bundles	33.17
Machine shop turnings	24.17
Mixed borings, turnings	22.17
Short shovel turnings	28.17
No. 1 Cast	35.00-36.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	47.00-49.00

CHICAGO

No. 1 heavy melting	42.50
No. 2 heavy melting	42.50
No. 1 bundles	43.50
No. 2 bundles	42.50
No. 1 busheling	44.00
Machine shop turnings	30.50-32.50
Mixed borings, turnings	33.50-35.50
Short shovel turnings	33.50-35.50
Cast iron borings	33.50-35.50
Cut structurals	46.50
Heavy turnings	42.50
Electric furnace bundles	45.50

Cast Iron Grades

No. 1 cupola	42.00-44.00
Stove plate	40.00-42.00
Unstripped motor blocks	36.00-38.00
Clean auto cast	45.00-47.00
Drop broken machinery	46.00-48.00

Railroad Scrap

No. 1 RR. heavy melt	45.50
R. R. Malleable	46.00-48.00
Rails, 2 ft. and under	51.50
Rails, 18 in. and under	53.50
Angles, splice bars	50.50
Rails, rerolling	52.50

BIRMINGHAM

No. 1 heavy melting	38.00
No. 2 heavy melting	38.00
No. 1 bundles	39.00
No. 2 bundles	38.00
No. 2 busheling	39.00
Machine shop turnings	29.00
Mixed borings, turnings	33.00
Short shovel turnings	30.00-32.00
Cast iron borings	30.00-32.00
Cut structurals	42.00
Heavy turnings	38.00
Punchings & plate scrap	41.50
Electric furnace bundles	41.00

Cast Iron Grades

(F.o.b. Shipping Points)

No. 1 cupola	44.00-45.00
Charging box cast	39.00-40.00
Stove plate	42.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	35.00-36.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 RR. heavy melt	41.00
Malleable	54.00
Rails, 3 ft. and under	46.00
Rails, 18 in. and under	48.00
Rails, random lengths	42.00
Cast steel	44.00
Uncut tires	43.00
Angles, splice bars	46.00
Rails, rerolling	48.00

ST. LOUIS

No. 1 heavy melting	40.00
No. 2 heavy melting	40.00
Machine shop turnings	30.00
Short shovel turnings	34.00

Cast Iron Grades

No. 1 cupola	43.00-45.00
Charging box cast	39.00-41.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	33.00-35.00
Brake shoes	41.00
Clean auto cast	46.00-47.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	50.00
Rails, 3 ft. and under	53.00-55.00
Rails, random lengths	45.00-47.00
Uncut tires	48.00
Angles, splice bars	49.00
Rails, rerolling	50.00-52.00

SEATTLE

No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	33.00
No. 2 bundles	27.00
Machine shop turnings	24.41
Mixed borings, turnings	24.41
Short shovel turnings	24.41
Electric furnace, No. 1	40.41

Cast Iron Grades

(F.o.b. Shipping Points)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	28.41
No. 1 wheels	47.00

Railroad Scrap

Rails, random lengths	38.41

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
No. 1 busheling	33.00
Machine shop turnings	12.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

(F.o.b. Shipping Point)

No. 1 cupola	39.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 RR. heavy melt	37.00
Malleable	55.00
Rails, 3 ft. and under	42.00
Rails, 18 in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades

(F.o.b. Shipping Points)

No. 1 cupola	44.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.00
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	44.50
Busheling	30.00
Busheling, new factory	
Prepd.	33.50
Unprepd.	31.00
Short Steel Turnings	32.50

Cast Iron Grades†

No. 1 Machinery Cast	50.00

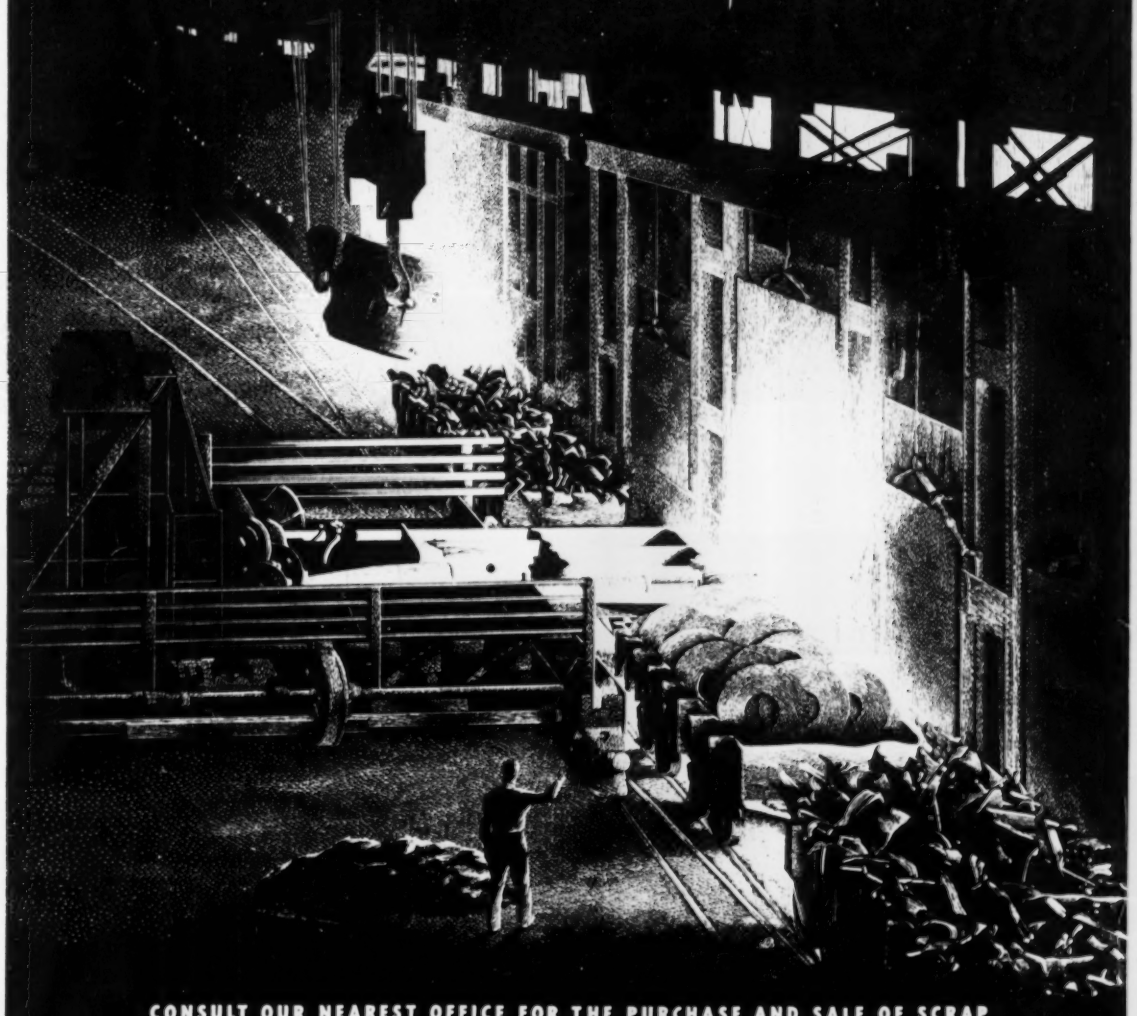
†F.o.b. shipping point.

OLD CEILING BASE PRICES

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	Grade 1 No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00

for the purchase or sale of | *scrap*



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LURIA BROTHERS AND COMPANY, INC.

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MODENA, PENNA.
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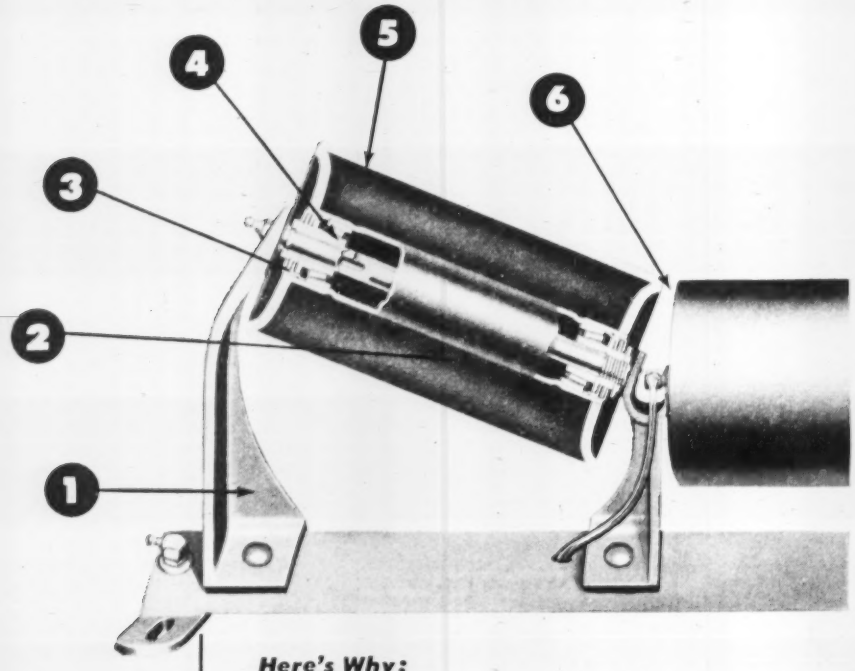
make sure you get full value for your belt conveying dollar



When you're figuring the cost of moving material by belt conveyor, it's important to remember that the belt idler, more than any other item of equipment, determines how low the ultimate cost per ton of material handled will be. Power consumption, belt life, maintenance costs, steady production flow, are all largely dependent on the ability of the idlers to keep rolling.

To make sure you get the most for your belt conveying dollars, you'll find it pays to standardize on Rex® Belt Conveyor Idlers.

Here's Why:

1. **The supporting brackets are unbreakable in normal operation. They remain rigidly tight and will stand abnormal usage without breaking.**
2. **The bearing mountings maintain positive bearing alignment under all conditions.**
3. **Rex Idlers have positive and permanent bearing protection against dust and dirt, and require minimum service attention . . . once every 1000 hours in normal operation.**
4. **Rex Idlers have high grade, precision, antifriction bearings with ample radial and thrust load capacity. This means lowest power consumption under all conditions.**
5. **The roll shells are of permanent unit construction with no joints to loosen or corrode. No replacements until idler is completely worn out.**
6. **The idler rolls are smooth and concentric and spaced in the idler assembly to protect the underside of the belt. The roll units are interchangeable for easy servicing.**

If your idlers have all these features, you're getting the most for your idler dollar . . . you're using Rex Idlers. If you're using any other idler, it can't possibly have all these outstanding features . . . you can't be getting lowest possible cost per ton handled on your belt conveyor.

So, if you haven't yet standardized on Rex Idlers, call your nearest Chain Belt Field Sales Engineer. He'll give you all the details. Or, if you prefer, write for Bulletin 51-81. Chain Belt Co., 4660 W. Greenfield Ave., Milwaukee 1, Wis.

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Distributors in principal cities in the United States and abroad.

The Metal Market

Piecemeal arrival of price decontrol on nonferrous metals causes maladjustments and throws secondary metals industry into a dither

AFTER MONTHS of clamoring for price decontrol, the secondary metals industry was thrown into a dither when it did come. Though prepared for the event, the industry wasn't expecting it to come piecemeal.

Rub is that bids on primary metals were not lifted at the same time. The turmoil won't subside until this is done. Pulling out of price stakes of all but the most critical metals is expected at any time. Action in copper is especially necessary as the only logical answer to a ludicrous situation.

Farcical Facts Secondary copper, on the basis of raw material costs, is now worth more than primary metal from domestic producers. No firm prices have been posted yet and orders for the most part call for price at time of shipment.

Ceilings on primary copper that doesn't contain more than 25 per cent scrap are still frozen at 24.50 cents a pound. Those using more than 25 per cent scrap have no controls to contend with. More interest is being shown in contracting for deliveries in the third and fourth quarters. Several nibbles have been reported at prices up to 32 cents a pound.

Down the Line In addition to scrap, some metals not threatening ceilings also added to the decontrol list. They include lead, zinc, tin, magnesium, antimony, cadmium and other minor metals.

Pressure for ending of all CMP authority before June 30 won't have substantial results. Some supply protection for defense fabricators must be maintained, according to Washington officials, and the open-end setup is the least objectionable way. Some form of controls is needed to protect small consumers' positions on mill schedules, they believe.

No Ticket Needed Placing of unrated orders for CMP products after expiration of normal lead times is now allowed. You have to find a mill with open space on its books though. Metal for March and April delivery can be placed now. For May delivery, you can try to place orders after Mar. 15, for June delivery after Apr. 15. Don't count on placing any orders until May at least.

Aluminum mill product deliveries, for example, are about 60 days late on scheduled month. Orders placed now for sheet, plate or extrusions couldn't be delivered till third quarter. Space exists for forgings at present though. Pressure on brass mills has eased slightly, and warehouse stocks are showing improved product mix.

Scrap Prices Move Up

In the first week of decontrol, refiners' buying prices of No. 1 copper scrap moved up 5½ to 6½ cents, indicating a selling price of refined metal of over 30 cents. One deal reportedly made last week was for a good tonnage of No. 1 copper scrap at 31 cents. Most dealers and buyers can't get together pricewise yet, though. Brass mills, ingot manufacturers and foundries are still under allocation as required by M-16, and may be continued under it until June. Scrap conversion arrangements between refiners and dealers under M-16 must now have NPA approval, and shipments from dealers to refiners under prior contracts that didn't require NPA permission must be completed by Feb. 28.

Zinc Market Weaker

Zinc markets are again unsteady with a further easing in London prices and lack of buying interest here. A further price dip is in the offing unless more customers can be induced to place orders. Lead is steady but slow, a price reversal is not in the cards here though. As effect of mine closings is felt, a tightening in supply and a firming in price can be expected.

Stockpile Up $2.4 Million

Strategic materials valued at $2.4 million went into the nation's stockpile in the last six months, the Munitions Board says. Inventory at end of 1952 was valued at more than $4 billion on basis of current prices, and the goal is about 78 per cent completed on a dollar basis. Goals are yet to be reached in bauxite, cadmium, copper, lead, zinc, manganese, mercury, platinum, tin and vanadium. Goals have been met in antimony, bismuth, fluorspar and iridium. Expansion programs under way are expected to provide the stockpile with aluminum, antimony, bauxite, beryl, cadmium, chromite, cobalt, columbite, tantalite, copper, fluorspar, lead, magnesium, manganese, mercury, molybdenum, nickel, platinum, rutile, tin, tungsten and zinc.

Nonferrous Briefs

Producers of beryllium-copper-base alloys were given authority to raise prices an average of 11 per cent over former ceilings.

International Materials Conference discontinued primary copper allocations for the January-March period and probably forever.

Between the known views of Treasury Secretary Humphrey and legislation to be introduced by Senator Byrd of Virginia, RFC looks like a dead duck.

Inventory restrictions on brass mill product distributors have been eased. Distributors may immediately replace materials sold rather than wait until the following month.

Zinc stocks rose slightly to 88,475 tons going into February. January production edged up to 81,994 tons, reports the American Zinc Institute. After shipments during January of 80,679 tons, unfilled orders stood at 39,732 tons.

General Motors Fabricast Division is putting up a new 100,000-square-foot aluminum foundry at Jones Mills, Ark., to turn out permanent mold castings for torque converter transmissions and several other automotive parts.

Harvey Machine Co. got Interior department approval of a contract for combination firm and interruptible power from Bonneville Power Administration to supply its new aluminum reduction plant at The Dalles, Oreg.

Magma Copper Co. bought up the Tiger, Ariz., properties of St. Anthony Mining & Development Co., which adjoin Magma's huge new low-grade copper ore body development.

Kaiser Aluminum & Chemical Co.'s $12-million Jamaica bauxite operation got under way last week as a 10,000-ton shipment was loaded for processing at Baton Rouge, La.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 25.25c.

Zinc: Prime western 11.50c; brass special 11.75c; intermediate 12.00c; East St. Louis; high grade 12.50c, and special high grade 13.00c, delivered.

Lead: Common 13.30c; chemical 13.40c; corroding, 13.40c; St. Louis.

Primary Aluminum: 99% plus, *ingots* 20.50c; *pigs* 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c nom.; No. 12 foundry alloy (No. 2 grade) 22.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.00c; grade 2, 21.00c; grade 3, 21.25c; grade 4, 21.00c.

Magnesium: Commercially pure (99.8%) standard *ingots*, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9% base sizes at refinery, unpacked, 60.00c; 25-lb pigs 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $205-$206 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.595 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (cases); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 89.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-$185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze, 95% 45.15; 90% 44.38; red brass, 85% 43.10, 80% 42.34; best quality, 41.35; nickel silver, 18% 55.08; phosphor-bronze grade A, 5% 64.71.

Rod: Copper, hot-rolled 41.37; cold-drawn 42.62; yellow brass free cutting, 33.85; commercial bronze 95% 44.84; 90% 44.07; red brass 85%, 42.79; 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 43.18; commercial bronze, 90% 47.04; red brass, 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze, 95% 45.44, 90% 44.67; red brass, 85% 44.39; 80% 42.63; best quality brass, 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 32.75c; 30,000 lb lots, 32.92; l.c.l. 33.42. Weatherproof, 100,000 lb, 33.60; 30,000 lb, 33.85c; l.c.l., 34.35. Magnet wire del., 15,000 lb or more, 38.75; l.c.l., 39.50.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance, across flats	Round — 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.0188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh). Sheets: Full rolls, 140 sq ft or more $18.50 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.50 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Dec. 15, 1952). Sheets, cold-rolled, 79.50c. Strip, cold-rolled, 85.50c. Rods and shapes, 75.50c. Plates, 77.50c. Seamless tubes, 108.50c.

MONEL

(Base prices f.o.b. mill, effective Dec. 15, 1952) Sheets, cold-rolled 63.00c. Strip, cold-rolled 66.00c. Rods and shapes, 61.00c. Plates, 62.00c. Seamless tubes, 96.00c. Shot and blocks, 54.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill). Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 3-10	24.50	13.30	11.50	121.50	20.50	34.50	60.00	85.25
Feb. 2	24.50	13.30	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 27-31	24.50	13.80	12.00	121.50	20.50	34.50	60.00	85.25
Jan. 22-26	24.50	13.80	12.50	121.50	20.50	34.50	60.00	85.25
Jan. 16-21	24.50	13.80	12.50	121.50	20.00	34.50	60.00	85.25
Jan. 15	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.75
Jan. 14	24.50	13.80	12.50	121.50	20.00	34.50	60.00	84.25
Jan. 13	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.75
Jan. 12	24.50	13.80	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 7-10	24.50	14.30	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 2-6	24.50	14.55	13.00	121.50	20.00	34.50	56.50	83.25
Jan. 1953 Avg.	24.50	13.838	12.596	121.50	20.173	34.50	58.654	84.442
Feb. 1952 Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. 1948 Avg.	21.50	14.825	12.00	94.00	15.00	33.00	33.75	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled 42.18c; oval 41.68c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 68c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point effective June 26, 1951. Ceilings on prices were lifted Feb. 13 but no prices have been posted.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	19.75
Phos. Bronze, 5%	25.25	25.00	24.00

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 27.00 nom.; No. 2 copper 25.00 nom.; light copper 23.50 nom.; refinery brass (60% copper) per dry copper content 24.50 nom.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 24.00 nom.; No. 2 23.00 nom.; light copper 21.00 nom.; No. 1 composition red brass 19.00 nom.; No. 1 composition turnings 18.50 nom.; mixed brass turnings 13.50 nom.; new brass clippings 17.00-17.50; No. 1 brass rod turnings 15.00-15.50; light brass 12.50 nom.; heavy yellow brass 14.50 nom.; new brass rod ends 15.50-16.00; auto radiators unsweated 15.00 nom.; cocks and faucets 16.50 nom.; brass pipe 17.50 nom.

Aluminum: Clippings 28 12.00 nom.; old sheets 9.00 nom.; crankcase 9.00 nom.; borings and turnings 7.00 nom.; pistons and struts 7.00 nom.

Tin: No. 1 pewter 70.00; block tin pipe 100.00; No. 1 babbitt 60.00.

Lead: Heavy 10.25-10.75; battery plates 5.25-5.50; linotype and stereotype 12.00-12.50; electrotype 10.25-10.50; mixed babbitt 13.75-14.00.

Zinc: old zinc, 5.00; new die cast scrap, 5.00; old die cast scrap, 4.00.

Nickel: Sheets and clips 50.00 nom.; rolled anodes 55.00 nom.; turnings 45.00 nom.; rod ends 55.00 nom.

Monel: Clippings 33.00 nom.; old sheet 30.00 nom.; turnings 25.00 nom.; rods 33.00 nom.

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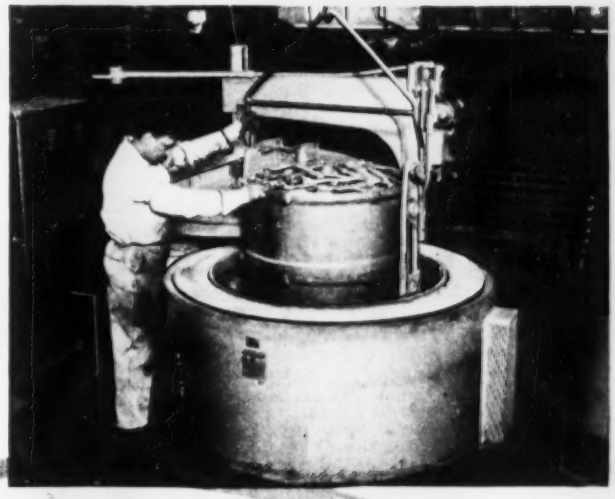

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Wire . . .

Wire Prices, Page 151

Boston—Except for a few products, upholstery spring wire and automotive volume included, orders are being taken for April-May, indicating broader distribution available for second quarter. For automobile assembly an increase of 20 per cent during the April-June period is projected and, if this objective is met, additional "free" tonnage for distribution will be correspondingly reduced from mills supplying that industry.

New York—How much open-end wire tonnage will be available for second quarter is problematical but for some products, not booked beyond April, supply will go far toward balancing demand. Wire products required for automobile output are excluded.

Sheets, Strip . . .

Sheet and Strip Prices, Page 149 & 150

Boston—Open-ending of steel distribution has increased pressure for procurement, notably for cold-rolled sheets. Except for galvanized and narrow carbon strip little, if any additional commercial tonnage will be available for second quarter. Straight chromium stainless narrow strip schedules are filled, reflecting heavy automotive demand and to some extent requirements for stainless electric welded tubing.

New York—Some smaller sheet consumers fear they will be at a disadvantage, compared with the larger, especially those identified with the automotive industry, once the recent open-ending of CMP allotments has an opportunity to become effective in actual practice. They doubt the situation will be put to a real test until the mills begin opening their books for third quarter, as they appreciate the fact producers generally are well booked for the entire second quarter.

Philadelphia—While sheet consumers generally welcome decontrol, some smaller sheet buyers wonder if they will fare as well in a free and open market as they have under the Controlled Materials Plan. Bigger and more important buyers can exert more pressure on the mills and upon occasion to the disadvantage of smaller consumers.

Pittsburgh—Pressure on the mills for hot and cold-rolled sheets will continue into third quarter. Pressing hardest for tonnage are consumer durable goods manufacturers who are hoping open-ending of CMP will make available to them a little more steel.

Cleveland—Decontrol of distribution is not expected to result in much change in tight sheet supply conditions over coming weeks. The mills are pretty well booked up through second quarter and allocations for the period must be honored. As a result, little so-called free steel will be available before third quarter. Even then, there is no certainty much additional tonnage will be available in the open market since the steelmakers still will be faced with the necessity of giving priority to military and defense needs. Further, there is no indication that the mills will be relieved of the tonnage burden on them in the form of directives, such, as in the case of sheet mills, of light plate tonnage which they are compelled to roll at the expense of sheet production.

Chicago—Open-ending of CMP hasn't altered the situation insofar as sheets are concerned. Facilities are fully committed through second quarter and numerous consumers report they haven't been able to place all their tickets. The cold-rolled sheet situation has been combed over by automakers and the guess is this may be the limiting factor in car assembly in second quarter.

See More Export Steel

New York—With the decontrolling of steel, a freer supply of tonnage for export is expected to develop eventually but exporters doubt if supply will ease much before beginning of second half.

At present, the Office of International Trade obtains allotments through the National Production Authority and issues licenses against these allotments. Actual licensing may continue for considerable time so as to make sure tonnage sold goes to "friendly" countries and that there are no shipments of critical items required for this country's defense needs.

A greater tonnage of steel for export, however, will undoubtedly become available and should be reflected in freer offerings within the next two to three months for shipment in third quarter.

Steel Bars . . .

Bar Prices, Page 149

Boston—Only in small sizes will additional commercial volume of carbon bars be available for second quarter, mostly in May-June schedules. Alloys and cold-finished 1½-inch and over are booked well through the period. Shell program is taking large part of production of larger cold-drawn. Inventories in smaller sizes are heavier. This accounts for easing in pressure from forge shops. Deliveries to forge shops have been heavy since the mills caught up on delinquent orders. First large shell contract has been placed in this area, $11 million for 155-millimeter, with New Bedford Defense Products, subsidiary of Firestone Tire & Rubber Co.

New York—Open-ending of the Controlled Materials Plan will have little bearing on bar distribution in first half. All CMP tickets will take preference throughout the period and as most mills are already confronted with more of these tickets than they can handle, there is little likelihood of "free" tonnage being available for delivery before July.

Philadelphia—Cold bar drawers say they have been receiving an increasing number of uncertified inquiries since open-ending action by Washington recently. They will be able to accept some for shipment before end of second quarter. Much will depend upon availability of hot bar stock. Until fairly recently some cold drawers have been accepting far more defense work than quotas called for. This work does not now appear so pressing and cold-drawers are more disposed to cut down on acceptances when possible so as to be in better position to service their regular trade.

Pittsburgh—Users of hot-rolled bars report deliveries are more current and in a better range of sizes. Not all the tonnage they would like in large diameters is being received, but inventories are approaching balance.

Cleveland—Consumers of large-size bars are not "kidding" themselves that open-ending of the Controlled Materials Plan will result in an early improvement in supply conditions. Actually, it is believed that so long as military and defense needs continue heavy, the pattern of distribution will remain pretty much as it has over past months. Of course, the barmakers will have a little more leeway in booking orders in the closing months of the year, but as things stand today there is little chance much open space in rolling schedules will appear before third, possibly fourth quarter.

Chicago—Barmakers can't see that consumers stand to gain this quarter and next by the CMP open-ending. Rolling schedules are completely filled through second quarter and there are still tickets for this period to be cashed.

Tubular Goods . . .

Tubular Goods Prices, Page 153

New York—Reflecting reduction in the price of zinc, the United States Steel Export Co. has made the following revisions in export base prices with freight included to New York, Philadelphia and Baltimore, effective with shipments from producing mills Feb. 4, 1953:

American standard pipe, t & c, galvanized buttweld 2½ and 3 inches, 17.65 per cent discount; galvanized seamless 2 inches, 2.65 per cent discount; 2½ and 3 inches, 4.15 per cent discount; 3½ and 4 inches, 6.15 per cent discount; 5 and 6 inches, 10.90 per cent discount.

English gas tubes, galvanized buttweld 2½ and 3 inches, 19.55 per cent discount.

Galvanized plain wire, $6.645 per 100 pounds. Galvanized barbed wire Lyman 4 pt. 5 in., $6.73 for 80 rod spool.

Boston—No longer are buttweld and light wall carbon electric tubing in short supply. With wrought iron pipe, supply is in balance with demand. Distributors are not taking all buttweld offered for April-May and prices at secondary level are easier.

Tin Plate . . .

Tin Plate Prices, Page 150

Pittsburgh—Tin plate producers who first estimated a weak second quarter in the offing are now taking a second look. From all indications, second quarter will be booked full. Relaxation of controls is a factor.

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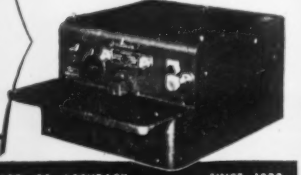

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Plates . . .

Plate Prices, Page 149

New York—Plate consumers see little early supply relief as result of the open-ending of CMP. Tickets will be given preference throughout the remainder of this half and tonnage covered by these tickets is heavier than most mills can handle. However, with elimination of all tickets except those carrying magic numbers for third quarter and beyond (unless there is some unexpected upheaval in the international situation) the great bulk of tonnage booked from perhaps April on will be of "free" character, as mills generally open books for the succeeding quarter around 60 to 90 days in advance.

Boston—If more commercial plate tonnage is available in second quarter it will be in narrow sizes and gages. Warehouses and most consumers are getting filled up, and with controls relaxed, some strip-mill plate capacity may be returned to sheet production.

Philadelphia—Plate production is expected to be sustained at high level throughout first half turning out rated work. Little, if any, "free" tonnage will be available during that period as a result of the recent open-ending action by NPA. Nor will there be much change in the type of plate produced so long as demand holds up, as production directives have already been set up for the remainder of the half and continue valid.

Pittsburgh—Demand for lighter gage plates will continue through second quarter. First sign of easier plate market situation is expected in the lighter plates. Deliveries are currently good.

Seattle—Small fabricators continue handicapped by limited plate supplies although some interests report conditions are improving.

Structural Shapes . . .

Structural Shape Prices, Page 149

Philadelphia—Fabricators are getting caught up a little on backlogs. Most of the larger shops now have more than 6 to 7 months work on hand, and the smaller plants no more than 3 to 4 months. However, with spring not too far off, there may be a seasonal spurt in building activity which will at least sustain backlogs, if not increase them.

Boston—Inventories of most fabricating shops are substantial. Lacking are specific sizes, representing minor, but needed tonnage for completion of work in progress. Some are making up deficiencies with foreign steel and from warehouse, although stocks with the latter are also unbalanced.

New York—A slight increase is noted in commercial building, but major demand is still for publicly financed projects, notably bridge work. The larger fabricating shops are booked months ahead as they are in position to profit most by bridge demand and numerous large public projects of other character.

Cleveland—Structural fabricators anticipate a substantial volume of business this year. They expect steel supply will show gradual improvement as the months pass. Building activity is described as better than normal for this season, this being explained by the open weather that has prevailed generally throughout the area this winter. Competition is keen for small jobs currently coming out, and price cutting of as much as $20 per ton erected is reported.

Chicago—It is too early to tell whether open-ending of CMP will help building construction. Odds are it is going to get little additional steel in first half because output of the structural mills is fully booked for this term.

Scrap . . .

Scrap Prices, Page 156

Buffalo—With a top buyer of steelmaking grades of scrap placing new orders at the former government ceiling prices, lifting of controls has had little effect on the market here. The buying mill is permitting dealers to ship at top prices until Mar. 1. Price ranges, however, on top grades are fixed with a 50 cent range, the inside figure being below the ceiling. The cast market continues weak with prevailing prices $4 to $5 under former control levels.

Boston—Steel scrap prices are not expected to rise with customers' inventories comfortable. Some buyers attribute recent purchasing for Morrisville, Pa., as sustaining prices on several grades. Consumers are taking shipments at the current rate of consumption.

New York—Scrap brokers' buying prices are unchanged at former OPS levels pending working off of various contracts. Market may begin to shape up more definitely within another week.

Philadelphia—Decontrolling of scrap prices has resulted in no change. Major grades are quoted at the same levels and on the same basis as heretofore. However, a trend toward reestablishment of historical differentials, such as have prevailed particularly in some of the steelmaking grades, is expected to set in shortly, with eventually all grades of scrap being quoted in this district on a delivered basis.

Pittsburgh—Decontrol of scrap prices has brought trading to a standstill. Old orders are moving at the former ceiling levels. Mills have good inventories and are content to sit back and await price developments.

Cleveland—Removal of government price control has served to inject a high degree of uncertainty into the scrap market with respect to the actual level of current prices. With buying at a virtual standstill, dealers are inclined to await developments. For the most part it appears that former ceilings are holding on the steelmaking grades with the blast furnace and cast grades continuing to display weakness. Expectations are that when the situation clarifies the steel grades will tend to advance, especially quality material.

Youngstown—Local steel mills, operating at the highest sustained rate in history, are virtually out of the scrap market. They are working off inventories accumulated during and since the steel strike last summer.

Chicago—Although lifting of iron and steel scrap price control had not been expected so soon, such action on Feb. 12 brought no reaction here. A week after decontrol the market remains untested. Some adjustments in steelmaking grades are probable and it is expected normal differentials will be restored. Mills have about 60 days' inventories and receipts against old contracts fairly well balance consumption. Weather is favorable to improvement in future supplies. In view of this, new buying and consequent establishment of price levels will come in orderly fashion.

St. Louis—Majority of scrap prices stuck to ceiling in this district after decontrol. Main exceptions were rails and axles, currently the scarcest item in the market. Turnings and borings dropped $1 to $2 below ceiling. Mills have told brokers they will deal, for the moment, on the basis of ceilings and no effort has been made to trim prices on outstanding orders. No new ones are being placed, however, and mills seem in no haste to do so, although generally their daily consumption is a trifle over their receipts. Speculation on the course of railroad scrap prices holds the market's interest. Missouri Pacific and MKT were to make the first post-decontrol offerings and, for the first time since lists were routed through Washington for allocation, mailed dealers invitations to bid. There is sentiment among melting steel consumers to reestablish a No. 1 grade of firm quality even at a premium price. They also want to push No. 2 bundles down, with a $1 or $2 differential.

Los Angeles—Removal of price controls has further undermined the scrap price structure in this district. Dealers are quoting the following prices: No. 1 heavy melting $2 lower to $30, No. 2 heavy melting $1 less to $26, No. 1 bundles off $4 to $29, No. 2 bundles down $3 to $24. Machine shop turnings remain at $12.

San Francisco—No. 1 heavy melting scrap dropped $4 a ton to $30 last week, falling away from the ceiling price for the first time as the whole price structure cracked. No. 1 bundles also dropped $4 to $29 a ton delivered. Other declines were $1 a ton for No. 2 heavy melting to $26 and $3 for No. 2 bundles to $24. Turnings remained unchanged at $12 a ton. No. 1 cupola cast weakened $1 to $39. Scrap is plentiful.

Seattle—Decontrol of scrap prices is not expected to greatly change market conditions in this area. Supplies are ample for current needs, with material offered better than average. From remote points Coast buyers will absorb up to $8.50 extra freight costs. Prices quoted here are: No. 1 heavy melting, $34; No. 2 heavy, $29; No. 1 bundles, $33; No. 2 bundles, $27; unstripped motor blocks, $29; rails $39.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 155

Pittsburgh—Bolt and nut producers report a brighter outlook for second quarter than they expected

several weeks ago. They have some first quarter open space. Over-all, however, they predict comfortable demand through June.

Pig Iron . . .

Pig Iron Prices, Page 148

Chicago—Foundry operations are the best they have been in months but they are still spotty. Some gray iron and malleable shops lack orders to work full weeks. It is reduced volume from the agricultural implement industry that is causing most of the irregularity. Pig iron supply is meeting current demand.

Boston—Melters of foundry and basic pig iron will go through the winter without serious supply problems despite suspension of the Mystic furnace during December and January. More outside foundry iron is stocked, including malleable.

New York—Pig iron requirements show little change here, with supply adequate. Gray iron foundry operations have not improved greatly since beginning of the year.

Buffalo—No easing of supply conditions is noted in the merchant pig iron market here. Producers report no iron is being piled with diversified demand showing improvement.

Philadelphia—Blowing out of a blast furnace at Steelton, Pa., has tightened pig iron supply here although there is sufficient tonnage to meet requirements. The Steelton stack will be relined and may be down until mid-April.

San Francisco—Pig iron is more plentiful. Foundries are not too rushed and they are consuming less. Cross-hauling is fading out and West Coast producers are trying to sell more in the "home" market.

Warehouse . . .

Warehouse Prices, Page 155

Cleveland—Over-all demand on warehouses in this district is reported sustained but individual orders are somewhat smaller. With distributors' stocks increasing, now estimated at 60 per cent of normal, consumers' tendency is to hold orders more closely to actual needs. Open-ending of the Controlled Materials Plan is expected to result in return of more normal marketing conditions, though effect of the decontrol action probably will not be noticeable much before third quarter.

Boston—Cold-rolled sheets have moved into the No. 1 spot as the tightest product with warehouses. Stocks of other critical products are improved, but in smaller sizes, leaving unbalanced inventories the major problem of distributors. Galvanized sheets are in ample supply.

New York—Inventories while still out of balance, are gradually improving. Even plates, structurals and bars are in slightly better supply on more sizes. Substantial volume of overdue tonnage has been delivered warehouses.

Chicago—Warehouses see no significant changes in their position or operations in first half because of the CMP open-ending. More steel is expected as production expands but products in short supply probably will continue short.

Philadelphia—Warehouse demand has less zip, but this may be temporary. Normally, March is one of the best months of the year.

Canada . . .

Toronto, Ont.—Steel demand is maintained at high level. Mills are booked solidly through first quarter. Some signs of early easing in hot-rolled steel products supply are seen but no immediate improvement is expected in cold-rolled.

Consumers show more interest in European supplies. According to information here French steel producers are cutting prices to meet sales competition in Canada. German mills are not participating in the price cutting, but Belgian and Luxembourg mills are keeping pace with the French.

Purchasing agents point out that on bars the French base price f.o.b. Antwerp dropped to $82.50 U.S., per 1000 kilos. That is believed to be bottom because steel shipped to Canada at a cost lower than home market value would be subject to the dumping duty. This price is still $5 per ton above the home market value of bars in Belgium and Luxembourg.

French, Belgian and Luxembourg bars are available to Canadian consumers at seaboard at prices lower

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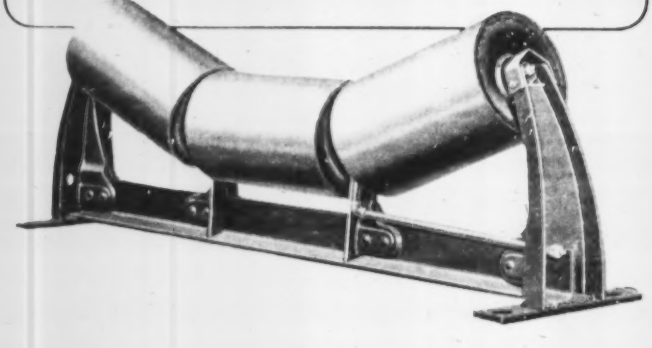

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than from U. S. sources, and in many sizes from Canadian mills. Competition in Canada from European producers will be more noticeable to American suppliers than to Canadian mills. Heavy structurals are showing more stability than bars, prices for I-beams and channels being established at $95 per metric ton f.o.b. Antwerp.

Hot and cold-rolled bars and galvanized sheets dropped $13 per ton during the past month, but prices still are too high to be of interest here. There has been no reduction in the price of plates and these are priced above the Canadian market.

Deliveries of European steel to Canada are 6 to 8 weeks ex-works, except for structurals, certain sizes of which are available only on the basis of 3 to 4 months delivery. A possible reduction in ocean freight rates of $3 per long ton is hoped for, but not before the opening of navigation.

Effective second quarter in Canada, hot-rolled sheets have been declared free from allocation and probably will be in free supply for remainder of this year. Cold-rolled sheets should be in better supply with the coming into production of new facilities at an Ontario mill. Shortage in galvanized sheets, especially lighter gages, will continue for some time. Demand for heavy plate is brisk and there is little prospect of early easing in present tight supply.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6000 tons, state thruway bridge work, Greene county, New York, through Savin Construction Co., East Hartford, Conn., to the Harris structural Steel Co., New York.

2100 tons, hangars, air base, Limestone, Me., to Luria Engineering Co., New York, through Corps of Engineers, Boston.

175 tons, two state bridges, Boston-Fall River Expressway, Bridgewater and Raynham, Mass., to Bethlehem Steel Co. through J. F. Fitzgerald Construction Co., Boston, general contractor.

75 tons, galvanized, Seattle city light substation, to Bethlehem Pacific Coast Steel Corp., low $26,462.

STRUCTURAL STEEL PENDING

5000 tons, 163 transmission towers, etc., Lo mile line; bids to Bonneville Power Administration, Portland, Oreg., Feb. 25.

1,000 tons, Elmendorf Air Field, Alaska, power plant; bids to U. S. Engineer, Seattle, Mar. 21.

800 tons, Washington state steamboat slough swing span; general contract to M. P. Butler, Seattle, low $930,424.

700 tons, Bensalem high school, Bucks county, Pa.; bids closed Feb. 18.

500 tons, steel frame building, steam heat and power plant and other facilities, Kodiak, Alaska, naval base; bids to Seventeenth Naval District, Seattle, Feb. 27.

150 tons, Reading railroad bridge, Montgomery county, Pa.; bids closed Feb. 20.

125+ tons, high school, Springfield township, Montgomery county, Pa.; bids closed Feb. 18.

100 tons, including reinforcing, 274-ft. highway span, Josephine county, Oregon; bids to Bureau of Public Roads, Portland, Oreg., Feb. 27.

Unstated, extension heat and power plant, steel frame, Eielson Air Field, Alaska; bids to U. S. Engineer, Seattle, Mar. 7; involves also coal and ash handling facilities.

Unstated, maintenance shops, gas stations and other installations, Ladd Field, Alaska; Grove, Shepherd, Wilson & Krug, low $1,018,281; two schedules to U. S. Engineer, Anchorage, Alaska.

Unstated, shops, gas stations and other facilities, Eielson Field, Alaska; Peter Kiewit Sons' Co., Seattle, low $557,727 to U. S. Engineer, Anchorage, Alaska.

Unstated, steel frame locomotive shop, Ft. Richardson, Alaska; bids to U. S. Engineer, Anchorage, Alaska, Mar. 11.

REINFORCING BARS . . .

REINFORCING BARS PLACED

190 tons, Washington state steamboat slough swing span, to Bethlehem Pacific Coast Steel Corp., Seattle; M. P. Butler, Seattle, general contractor.

185 tons, Washington state LaCamas bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; Troy Burnham, general contractor.

REINFORCING BARS PENDING

300 tons, 7-story, 100-bed hospital, Elmendorf Field, Alaska; J. C. Boespflug Construction Co., Seattle, low $8,145,000 to Alaska District U. S. Engineer.

Unstated, $1.5 million, 4-story office building for Pacific Telephone & Telegraph Co., Seattle; bids Feb. 26; selected contractors to Jones & Binden, architects, Seattle.

Unstated, marine barracks, runway, etc., Adak, Alaska, navy station; general contract by Seventeenth Naval District to Raber & Kief and Raber & Co., joint low, $1,273,500.

Unstated, two 200-man barracks, Ladd Air Field, Alaska; general contract to Peter Kiewit Sons & Co., Seattle, low $1,236,096.

Unstated, administration building, Ft. Richardson, Alaska; general contract to Field & Brezina Construction Co., low $765,981.

PLATES . . .

PLATES PLACED

600 tons, oil storage tanks, Portland, Oreg., for General Petroleum Co. to Chicago Bridge & Iron Co., Seattle.

222 tons, 1-inch structural plate, Corps of Engineers, Pittsburgh, to the United States Steel Export Co., New York.

100 tons, elevated water storage tank, Toppenish, Wash., to Pittsburgh-Des Moines Steel Co., Seattle branch, low $78,297.

PLATES PENDING

Unstated, plans in preparation for expansion, Manchester, Washington, naval fuel depot, $2 million proposed project; bids soon.

Unstated, 1-million-gallon elevated water storage tank, Richmond Highlands; bids to Seattle, Feb. 18.

PIPE . . .

CAST IRON PIPE PENDING

100 tons, 3,000 feet, 8-inch water pipe; class 150 or alternatives; bids to city clerk, J. E. Law, Port Angeles, Wash., Feb. 18.

RAILS, CARS . . .

RAILROAD CARS PLACED

Duluth, South Shore placed 100 fifty-ton gondola cars to the American Car & Foundry Co., New York.

Louisville & Nashville, 2000 freight cars to the Pullman-Standard Car Mfg. Co., Bessemer, Ala., the Pressed Steel Car Co., Mt. Vernon, Ill., and Bethlehem Steel Co., Johnstown, Pa.; list comprises 1000 forty-foot box cars, 500 fifty-foot box cars and 500 gondola cars.

Southern Pacific, 24 chair cars, to going to the Budd Co., Philadelphia, 10 to the Pullman-Standard Car Mfg. Co., Chicago.

Union Pacific, 70 passenger cars, reported placed with American car & Foundry Co., New York; list includes 15 units equipped with domes.

RAILROAD CARS PENDING

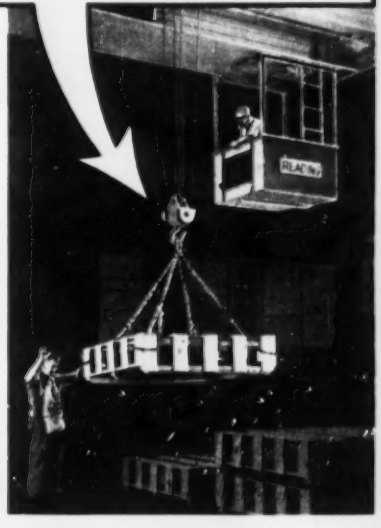
Long Island, 112 electric passenger cars, contemplated as needed for complete modernization of the railroad's electric passenger car fleet; no indications as to how soon any of this equipment will be placed on inquiry; full rehabilitation of 508 of its present cars also is contemplated.

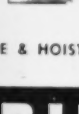
They picked a "READING" CRANE to shorten their load handling cycle ...

When this well-known stove manufacturer wanted to speed up assembly, he put his problem to "Reading" engineers. Installation of a 10-ton, double I-beam, cab-controlled "Reading" crane brought even greater results than expected. There are good reasons.

All "Reading" electric cranes — cab or floor controlled — are "job tailored". There is no extra cost for this special engineering service. Actually, costs go *down*, because motor, trolleys, brakes and hoisting units are assembled into a crane that fits your needs exactly.

You get greater operating efficiency. More accurate spotting is possible. Precise speed control is assured. Moreover, maintenance costs are minimized because each unit can be removed and serviced individually without dismantling entire crane. Get complete information by writing for our latest 16-page bulletin, "The *Why* and *How* of Faster Production".

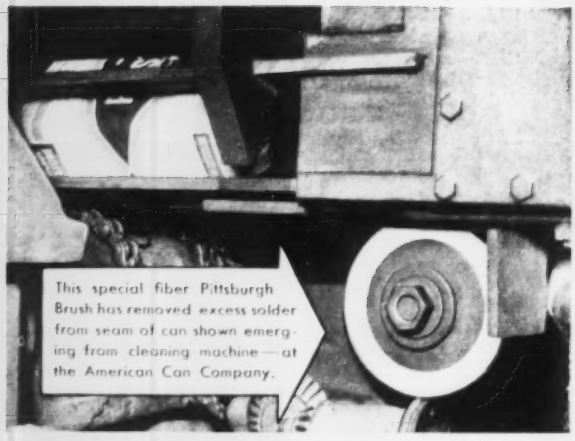




READING CRANE & HOIST CORP. • 2102 ADAMS STREET, READING, PA.

Chain Hoists Electric Hoists Overhead Traveling Cranes

READING CRANES


This special fiber Pittsburgh Brush has removed excess solder from seam of can shown emerging from cleaning machine—at the American Can Company.

"Wouldn't be without them!"

say the men who use . . .

Power-driven Pittsburgh Brushes for longer life, better work!

Last longer, much safer—Cloth brushes formerly used at the American Can Co., Jersey City, to wipe excess solder from can seams lasted less than an hour, occasionally caught fire. Switching to special fiber Pittsburgh Brushes, American Can now gets better than 15 hours life per brush and the fire hazard has been eliminated. Supervisory personnel reports: "We wouldn't be without them!"

Last longer, do better job—In producing wall and ceiling panels, at the Barclay Manufacturing Co., New York City, dust caused by routing "mortar lines" settles on the panels, must be completely removed before panels can be bake-finished. Brushes originally used had a short life span, wore unevenly, and did so poor a job that many baked panels had to be completely refinished to pass inspection. Since even a "fairly good" brush would not do, Barclay searched for the "perfect" brush—and chose Pittsburgh! Result: Better work, and costly refinishing eliminated.

Last longer, better constructed—The Windalume Corporation, Kenvil, N. J., manufacturers of aluminum windows, uses Pittsburgh wire brushes to remove burrs caused by milling. The wire bristles on the brushes used formerly broke off easily. Windalume replaced them with Pittsburgh Brushes because they are better constructed—and Pittsburgh Brushes last longer!

WRITE TODAY FOR FREE BOOKLET!

Write today for a free copy of our booklet that shows, through actual case histories, how Pittsburgh can help cut *your* brushing costs. Address: Pittsburgh Plate Glass Company, *Brush Div.*, Dept. W-11, 3221 Frederick Ave., Baltimore 29, Md.

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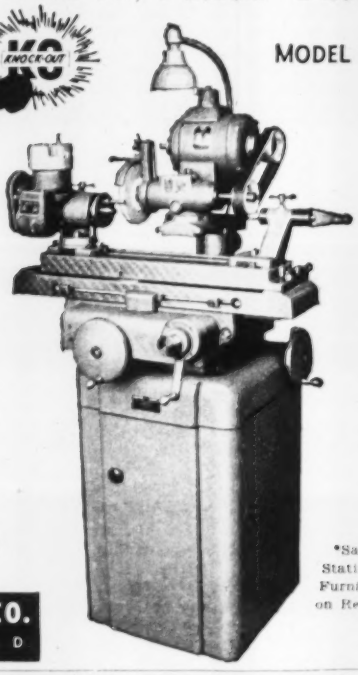
PITTSBURGH PLATE GLASS COMPANY

There's a reason 76%* of all popularly-priced Tool and Cutter Grinders sold in 1952 were "*Knock-Outs*"

MODEL B860



Will do anything that machines costing 2 or 3 times more will do . . . yes and in less time.

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ABERDEEN, S. D.

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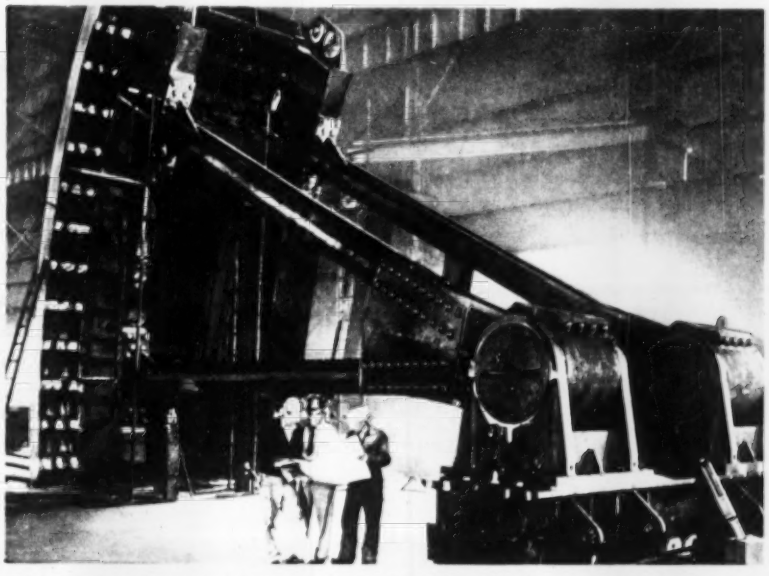
famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbiuger, 334 N. San Pedro St., Los Angeles, California. Canada: E. F. Barber Machinery Co., Toronto, Canada.*

PERFORATED METALS
FOR ALL INDUSTRIAL USES
PERFORATIONS IN LIGHT SHEETS
TO HEAVY PLATES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

Metalworking Notes



Engineers Dwarfed by Regulating Gate

Towering over three engineers of the Consolidated Western Steel Division of U. S. Steel Corp. is the second of three 225-ton steel regulating gates for the Garrison Dam near Bismarck, N. D. The gate is completely fabricated and erected in a large work bay at the Maywood, Calif., factory of Consolidated Western. A third gate for the dam is nearing completion and will be shipped soon

Breaking Ground for Buildings

Ground will be broken May 1, 1953, for Ceco Steel Products Corp.'s new Pittsburgh office and plant. The factory building will provide 80,000 square feet of manufacturing and warehousing space.

Agree to Sell Tilting Arcs

Pacific Airmotive Corp., Burbank, Calif., will manufacture and sell Rohr Tilting Arcs under terms of an exclusive licensing agreement with Rohr Aircraft Corp., Chula Vista, Calif.

Steber Announces Addition

Steber Mfg. Co., Broadview, Ill., announced an addition of about 18,000 square feet to installations for manufacture of outdoor lighting equipment and infrared heat lamp brooders.

New Representative Appointed

Pennsylvania Crusher Co., Philadelphia, appointed the Mine & Smelter Supply Co., Denver and El Paso, Tex., as representatives in nine southwestern states.

Olin Forms Research Group

Olin Industries Inc., East Alton, Ill., announced formation of a General Research Organization which will conduct basic research and work with all Olin manufacturing divisions on varied research problems.

Parker Appoints New Distributor

Florida Metals Inc., Jacksonville, Fla., will distribute industrial tube fittings and tube fabricating tools manufactured by the Parker Appliance Co., Cleveland.

Stokes Opens Laboratory

A new laboratory having complete facilities for testing and developing materials, equipment and processes for customers was opened at F. J. Stokes Machine Co., Philadelphia.

Florida Company Purchased

The Smith-Victory Corp., Buffalo, manufacturer of hair pins, purchased Mervin Curl Clip Co., Orlando, Fla., and will house part of the company in a plant addition in Buffalo.

American Cam Breaks Ground

American Cam Co. held groundbreaking ceremonies for a new plant at Bloomfield, Conn., on Jan. 10. The building will be completed about May 1.

Cory Production at Full Scale

Cory Corp., Chicago, reports that full scale production of three Fresh'nd-Aire electric room air con-

LIL CHAMP SAYS...
"INSURE SAFE DEPOSITS— BANK ON CHAMPION WELDING ELECTRODES"
BUY IT'S JUST LIKE PUTTING MONEY IN THE BANK USING CHAMPION ELECTRODES! SOUND, SAFE DEPOSITS MORE WELD FOOTAGE !!!
BROTHER I AGREE THERE'S NOTHING LIKE 'EM FOR FAST WORK!
FOR TOP QUALITY WELDS CHAMPION ELECTRODES DELIVER THAT EXTRA FACTOR OF SAFETY! THERE IS A DEPENDABLE CHAMPION ELECTRODE FOR ANY WELDING APPLICATION
VAULT
THE CHAMPION RIVET CO.
CLEVELAND, OHIO
East Chicago, Ind.

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Pouring steel castings at AVONDALE'S Foundry Division

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Steel is the tool, the medium which AVONDALE uses. Steel towboats, barges, drill rigs for the Oil industry; steel ships and equipment of all kinds for the marine industry; steel for Navy and U. S. Engineer jobs. AVONDALE builds and repairs and fabricates with steel; its foundry division pours steel day in and day out . . .

AVONDALE MARINE WAYS, Inc.

Main Plant: Avondale, La. "Quick Repair Plant": Harvey, La.
Foundry Division (Service Foundry): New Orleans, La.

The *Cleveland Steel Tool Co.*

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OHIO LOCOMOTIVE CRANES

25 TO 50 TON CAPACITY

DIESEL · GASOLINE · ELECTRIC · STEAM

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

DETROIT STAMPING COMPANY

Especially geared for light to medium heavy stampings and high volume runs of small, intricate "Multi-Stampings." We invite your inquiry or write for Stamping Brochure.

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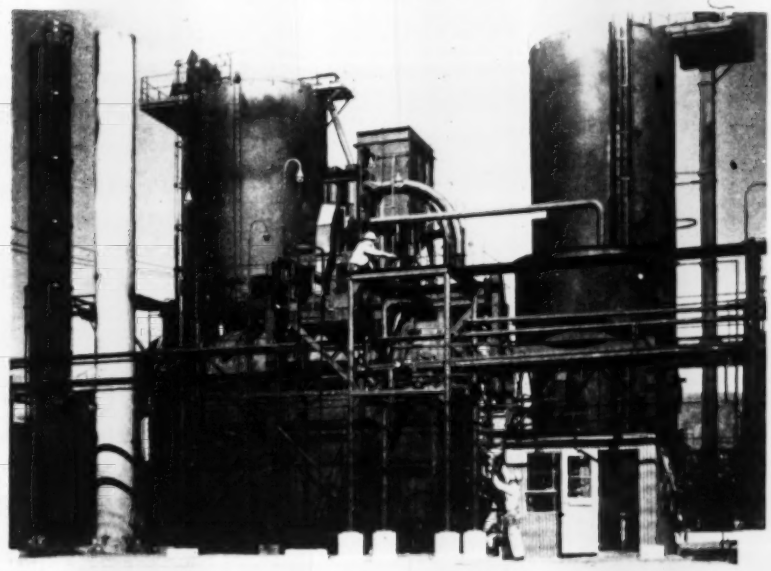
STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.



Koppers Opens a New Tar Products Plant

The photograph above shows Koppers Co. Inc.'s new $2.5-million tar products plant at Fontana, Calif. The facilities here are operated by Koppers' Tar Products division. The plant will process crude tar from nearby Kaiser Steel Corp.'s Fontana works into creosote, coal-tar enamels and other industrial products

ditioners is under way at its newly acquired plant at Grayslake, Ill.

Acquires New Business

Continental Can Co. Inc., New York, acquired assets and business of the Benjamin C. Betner Co., Devon, Pa., in exchange for 73,177 shares of common stock.

Contract for Steel Car Co.

Pressed Steel Car Co. Inc. was awarded a contract by the Chicago Ordnance District for operation and maintenance of the Rockford, Ill., ordnance plant beginning March 1.

Heads Electro-Platers

Lawrence J. Hay, president of Plating Service Co., Chicago, was elected chairman of the Chicago Electro-Platers Institute, to succeed Carl F. Hansen, Advance Tinning Co., Chicago.

Distributors Re-elect President

Jerry I. Baron of Baron Steel Co., Toledo, O., was re-elected national president of the Association of Steel Distributors Inc. for 1953.

Select Association Secretary

George W. Proffit was selected as executive secretary of the Copper & Brass Warehouse Association, with headquarters in New York.

Newark Buys Company

Newark Wire Cloth Co., Newark, N. J., purchased Cosgrove Wire Cloth Co. Inc., Belleville, N. J. Cosgrove will continue under the present name.

New Aluminum Hardware Line

Yale & Towne Mfg. Co., New York, is producing a new full line of locks and builders' hardware fabricated of aluminum.

Building for Bendix Division

Bendix Aviation Corp.'s computer division will be housed in a $175,000 plant now being built in Los Angeles.

Forms Company for Sales

Fonda Gage Co. Inc., Stamford, Conn., announces that all sales of Fonda Gage Co. will now be made through Fonda Gage Sales Corp., Port Chester, N. Y.

Soreng Acquires Two Companies

A newly-organized manufacturing company, Soreng Products Co., acquired ownership of Soreng Mfg. Corp., Schiller Park, Ill., and Sampsel Time Control Inc., Spring Valley, Ill.

Plans for Warehouse

An industrial steel warehouse representing an investment of about $500,000 will be constructed by Richards & Conover Hardware Co. in Kansas City, Mo. Plans call for a 56,000-square foot warehouse building.

Towboat Completed for J & L

A new diesel towboat, built in St. Louis for Jones & Laughlin Steel Corp., Pittsburgh, was completed by

INDUSTRIAL TRACK

Need Rails—Switches—Frogs—Guard Rails—Track Tools? For best selections, prompt deliveries—*try FOSTER*—shipments from stock in 5 nationwide warehouses.

Call on FOSTER for everything in Industrial Track Equipment and supplies.

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ACID-ALKALI-PROOF TANKS & FLOORING

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COMPANY.....

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CITY.....ZONE..STATE....

METALWORKING NOTES——

St. Louis Shipbuilding & Steel Co., which has two other boats under construction for J & L.

To Build Circuit Breakers

Some 18 of the world's largest circuit breakers, with an interrupting rating of 25 million kva at 330 kv, will be built for the Atomic Energy Commission project near Portsmouth, O., by Westinghouse Electric Corp., Pittsburgh.

Sales Office Moved

New location of Surface Combustion Corp.'s Detroit sales office is 10333 West McNichols Road, Detroit 21.

GM Division Awards Contract

The Fabricast division of General Motors Corp. awarded the general contract for construction of the division's new plant in Jones Mills, Ark., to Baldwin Co., Little Rock, Ark.

Alabama Company Modernizes

A recently modernized battery of 25 coke ovens at the Tarrant, Ala., plant of Alabama By-Products Corp. was lighted last week. The battery represents reconstruction of a former battery, one of six comprising the company's complement of 203 ovens.

Thompson Expands Plant

Thompson Products Inc. plans to expand its Euclid, O., plant to handle a $1,250,000 Navy award for high-altitude aircraft accessories.

Buys Manufacturing Plant

The Multi-Clean Products Inc., St. Paul, completed negotiations for purchase of the manufacturing facilities of the Industrial Vacuum Cleaner department of General Electric Co.

GE Builds Canadian Plant

Canadian General Electric Co. began construction of a $200,000 plant in Toronto, Ont., scheduled for completion in April.

GM Institute Expands

Spokesmen of General Motors Institute, Flint, Mich., announced expansion of the institute comprising a new building of 83,000 square feet.

Wickman Completes Factory

Wickman Mfg. Co. completed its new factory in Detroit. Office and factory employees will be housed there.

Secures Control of Foundry

C. A. Goldsmith Co., Newark, N. J., producer of aluminum and bronze castings, acquired all outstanding capital stock of Atlas Foundry Co., Irvington, N. J., producer of gray

CIMCO SELECT MACHINE TOOLS GUARANTEED

Bullard 42" Vertical Boring Mill, late type, 4 jaw chuck table.
Niles 36-44 Vertical Boring Mill.
King 42" Vertical Boring Mill, 2 heads.
3" bar Universal Boring Mill, late type.
Niles 42"-56" Driving Box Borer, Burnisher and Facer, late type.
Brown & Sharpe #3 Vertical Miller.
Cincinnati #3 Hi-Power Vertical Miller.
Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #50 Internal Grinder.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Heald 42 Borematic.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Abrasive #33 Surface Grinder, motor in base.
Lodge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning 20" swing, 24½" hole in spindle, 54" centers.
Bradford 20" x 18', 4 SCD, 12' center distance, Loose change.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 72" Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 2-26 Gear Cutter.
Oliver Template Tool B1 Grinder.
Lodge & Shipley 16" x 126" centers G H Lathe, Timken bearing, complete with taper attachment, late type.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, D.C. reversible drive.
Landis 26" x 168" Plain Cylindrical Grinder.
American 30" x 14' G H Lathe, 12 speed.
Monarch 24" x 12' G H Lathe, complete with 22½" 4 jaw chuck and taper attachment.
American 36" x 40" Lathe, Internal Face Plate Drive, with 4" raising blocks, 32" center distance.
Bliss #38 Drawing Press, 5" stroke.
Pond 84 x 84 x 16' Double Housing Planer, 10' motor drive, 4 heads.
Cincinnati #2 Centerless Grinder.
Cincinnati-Bickford 4'11" column Radial drill, gear box on base.
Cincinnati-Bickford 3'5" Radial Drill.
Hanchett No. 600-56" UK Traveling Wheel Face Grinder, new 1946, table 72" x 86" long, 100 HP grinding wheel motor.
Baker #217 Upright Drill Press.
Gisholt 1L Saddle Type Turret Lathe with bar feed, late type.

GUARANTEED MACHINERY

Cincinnati Machinery Company Incorporated
207 E SECOND STREET
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FOR SALE:
3 40-ton used Ladles with bail and stopper Rigging
1 20-ton used Ladle without bail or stopper rigging.
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And Further information write STEEL, Penton Bldg., Cleveland 13, O

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STEEL BUILDING
Suitable for Dismantling and Re-erection
70 ft. to 80 ft. wide
200 ft. to 300 ft. long
Write Box 670, STEEL
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WANTED
COMPRESSOR
2-stage
650 to 1500 C.F.M.
Prefer 440 volt synchronous motor.
Must be in excellent condition.
Please advise full particulars.
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5 Ton Crane for 80' span cab operated.
Submit all details in writing to—
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WANT TO PURCHASE
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FOR SALE
Roots Connersville Blower—complete with a No. 3 Cutler Hammer—new starter $2,000.00.
C. B. S. STEEL AND FORGE
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NEW AMERICAN MADE MACHINES FOR QUICK DELIVERY:
10' x ¼" Shears
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All sizes O.B.I. Presses
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To read the classified pages of STEEL each week. You will find listed there surplus materials and used equipment for sale which may fill your requirements to a tee and save you much time and effort locating them.

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin All-Steel, 50-Ton, Cross Dump
Tank, 3,000 Gallon, High Pressure
Tank, 8,000 Gallon, Coiled and Non-Coiled
Hoppers, All-Steel, 70-ton, Cross Dump

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70′ and 74′

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton Drop Door
Side Dump, 30-YD., 50-TON, DROP DOOR

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Jordon Spreader—BUILT 1937
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300 H.P., 70-Ton, Type 0-4-4-0
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6,000 Gallon
8,000 Gallon
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Positions Wanted

REGISTERED PROFESSIONAL ENGINEER 15 years diversified electrical and mechanical development experience. Now employed as plant superintendent by company engaged in general machinery repair, motor repair, and manufacturing. Desires responsible supervisory position requiring above average ability. Small town not objectionable. Write Box 637, STEEL, Penton Bldg., Cleveland 13, Ohio.

BASIC STEEL PLANT MANAGER 40 years old, successfully experienced in works management. Have directed and coordinated staff services for safe, profitable operations. Prior experience as superintendent in steel producing and flat rolling departments. Write Box 659, STEEL, Penton Bldg., Cleveland 13, Ohio.

GOVERNMENT RELATIONS AND INFORMATION SPECIALIST wishes to represent industrial firm or trade association in its business contacts with the government in Washington. Moderate salary. Broad background of experience with the government and with private industry. Qualified business research analyst. Familiar with the metalworking industries. Permanent resident of Washington for more than 25 years. Top level references. Write Box 660, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER: M.I.T. GRADUATE WITH 25 years' experience in Plant Management, including Production planning, machine and plant loading, Material and tool control, quality control, purchasing, incentives, standard costs, variable budgets, overhead analysis and break-even charts, job evaluation, supervisory responsibility chart, and labor relations. Capable administrator with excellent record. Write Box 671, STEEL, Penton Bldg., Cleveland 13, Ohio.

INDUSTRIAL ENGINEER—PLANT MANAGER Age 37, college graduate, 15 years experience production planning, process and tool engineering, quality control, purchasing, standard costs and time study in home appliance manufacturing industry. Write Box 673, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

SMALL FABRICATING PLANT ESTIMATOR. Must have experience in take off, estimating for component parts of ships et cetera. Must have shop experience as to layout and production. Warrants good salary for capable man in small town North Florida. Replies held confidential. Applicant must have good references. Write Box 672, STEEL, Penton Bldg., Cleveland 13, Ohio.

ASSISTANT TO GENERAL MANAGER

New England manufacturer of expanding line of automatic presses and progressive dieing machines seeks man as Factory Manager and assistant to General Manager. Must have broad experience in heavy machinery manufacturing, demonstrated executive ability, and M.E. degree. Excellent long range opportunity with attractive starting salary in our Henry & Wright Division. Send complete resume of qualifications to F. William Gray, Personnel Director, Emhart Mfg. Co., Hartford 1, Conn.

AGE NO BARRIER

We seek a man long experienced in stainless steel production who can train men to operate a continuous strip mill for hot and cold stainless steel. Unusual opportunity for someone now retired or in semi-retirement. Position for two years at least. In attractive Niagara Peninsula. Send application or resume to Robert Teasdale, Atlas Steels Limited, Welland, Ontario.

CHIEF METALLURGIST FOR SAW MANUFACTURING PLANT

Requirements: Graduate with at least five years experience in the fabrication and uses of metals.

write

President
ATKINS SAW DIVISION
BORG-WARNER CORPORATION
INDIANAPOLIS 9, INDIANA

WANTED
ESTIMATING AND DIE DESIGN ENGINEER — DROP FORGING

Must have experience in laying out multiple impression forging dies, and estimating of forgings, five pounds and under. Some die sinking and forge shop experience preferred. Additional opportunities in management available for person with proper qualifications.

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Penton Bldg. Cleveland 13, Ohio

Wanted
FORGE PLANT SUP'T.

With flat die forging experience in alloy and tool steels. Jobbing shop work. Must be capable of planning and expediting production and keeping modern equipment in good working condition. General knowledge of heat treating and rough turning, essential. Proven work record necessary. Salary open. Location: Ohio. Write stating details to

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Penton Bldg., Cleveland 13, Ohio

Belgian metalworking Company seeks
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to manufacture in Belgium patented
STEEL SHEET PRODUCTS

Its modern equipment of shears, presses, welding machines, etc. is adapted to all sheet and platework up to ¼ inch thick. Excellent selling organization covering Western Europe.

Write to: **LEON G. RUEQUOI,** Representative of Belgian Federation of Metalworking Industries, 30 Rockefeller Plaza, New York 20, N. Y.

OTTAWA OSP STEEL PRODUCTS INC.

HARDENED AND GROUND SCREW MACHINE PRODUCTS

EVERY ITEM PRODUCED PRECISELY

- SPLINE SHAFTS
- VALVE PLUNGERS
- PUMP SHAFTS
- ENERGY CELLS (Lanova Type)
- CONTROL VALVES
- ROTOR SHAFTS
- ROTOR LINERS
- OUTER RACES
- VALVE TAPPET ROLLERS

OTTAWA
STEEL PRODUCTS, INC.
GRAND HAVEN, MICHIGAN

Steelmen Watch an Engineers Exhibit

An interested group of iron and steel operation and maintenance men view part of Westinghouse Electric Corp.'s iron and steel engineers exhibit. For the purpose of taking the product to the customer, the exhibit is shown, here, at Hammond, Ind. An engineer is showing how a crane control can gently lower a motor

tron, carbon steel and stainless steel castings.

Marine Division Formed

Strong, Carlisle & Hammond Co., Cleveland, formed a new marine division in its industrial supply department, to meet the needs of the marine industry.

Canadair Acquires Company

Canadair Ltd., Montreal, Canada, acquired control of Fleet Mfg. Ltd., Ft. Erie, Ont. Fleet will operate as a Canadair branch plant.

To Handle Disston Line

The Industrial Castings & Forgings Co., a sales organization, was appointed to handle the steel products line of Disston Co. in the Pittsburgh area. The Disston main plant is in Philadelphia.

Appoints Georgia Distributor

American SIP Corp., New York, appointed the Noland Co. Inc., Atlanta, as its distributor in Georgia.

GE Addition Approved

The Air Force approved construction of a million-dollar addition to General Electric Corp.'s plant near Johnson City, N. Y. The new building will be used for complete controlled testing of aircraft armament systems.

Steel Allotted for Refinery

The Petroleum Administration for Defense set aside 2828 tons of steel for use in building a new oil refinery at Tacoma, Wash. The refinery will be built by the Pacific Oil & Refining Co.

A. Milne Acquires Warehouse

A. Milne & Co., New York, distributors of solid and hollow tool steels, announce the addition of a warehouse at 753 Chestnut St., Atlanta.

Chrysler Building Progresses

Work is proceeding in Newark, Del., on construction of a $3.1 million government-owned plant to be built and operated by Chrysler Corp. for modification and final processing of military tanks for Army Ordnance.

Contract for Salem—Brosius

Salem-Brosius Inc., Pittsburgh, received from the National Advisory Committee for Aeronautics a contract for design and construction of two butterfly valves for use in aircraft propulsion research. The valves will be 15 feet in diameter.

Sylvania Plans Building

Sylvania Electric Products Inc. plans to spend between $1.5 million and $2 million in 1953 for expansion of radio and television manufacturing facilities in Buffalo.

Standard Sulphur To Build

A new company, Standard Sulphur Co., will soon begin building a $450,000 mobile sulphur plant about 40 miles south of Houston.

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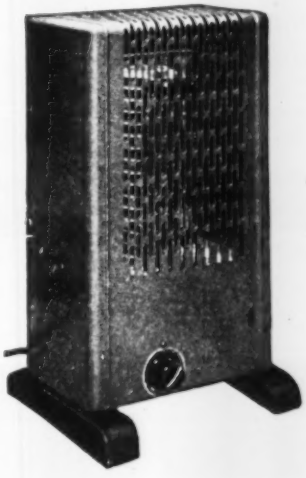


Why not use Perforated Metal?

This Wesix Electric Heater shows a typical application of Hendrick Perforated Metal, combining utility and attractiveness. The heater guard is 20 gauge steel, with 3/16" x 1½" side stagger perforations.

With facilities for producing any required shape and size of perforations in any commercially rolled metals, Hendrick invites inquiries from manufacturers who may be considering the use of perforated metal in connection with any of their products.

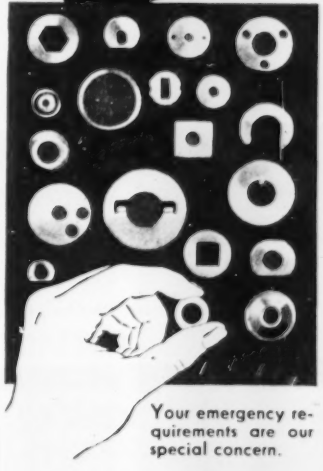
SEE OUR CATALOG IN SWEET'S

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

HENDRICK
Manufacturing Company
30 DUNDAFF STREET, CARBONDALE, PENNA.
Sales Offices In Principal Cities

Standard .. Specials

STEEL WASHERS FOR EVERY NEED



A DEPENDABLE SUPPLIER FOR 38 YEARS . . .

Your requirements for standard and special steel washers are sure to be satisfied at Joliet. A bank containing thousands of special dies in many shapes and forms, 9/32" to 8" O.D., gauges No. 28 to 3/8", stands ready to answer your needs. A VARIETY OF FINISHES IS AVAILABLE to meet your special needs, including: Electro-plating, Galvanizing, Parkerizing, and Cyanide hardening.

Your emergency requirements are our special concern.

After All!
THERE'S NO SUBSTITUTE FOR QUALITY AND SERVICE

202 CONNELL AVE.
JOLIET, ILLINOIS

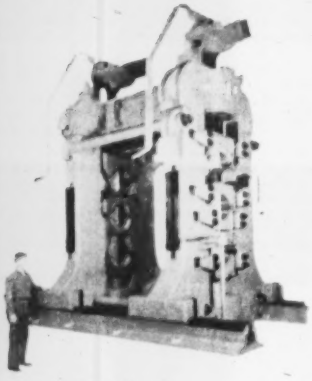
JOLIET WROUGHT WASHER CO.

Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

Rolling Mill Equipment

Outstanding in quality and in performance Hyde Park Rolling Mill Equipment has enjoyed the respect of the industry for more than fifty years.



Bar Mills
Merchant Mills
Sheet and Strip Mills
Pinion Stands
Roller Tables
Reduction Drives
Stretcher Levellers
Guillotine Shears
Sheet Mill Shears
Roll Lathes
Special Machinery
Machine Work

Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.
ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

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WORM GEARING—universal in its application—affords advantages for almost every power transmission job. Whether you want worm gearing sets or speed reducer units, you will find drives to meet your need in the complete Cleveland line.

Vickers Inc. hydraulic winch in operation on a Piasecki Hup-1 helicopter. Inset at left shows built-in Cleveland worm gearing.

Small Cleveland gearing speeds sea rescue

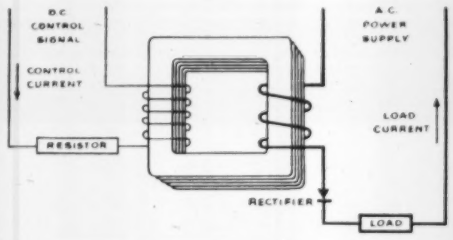
CLEVELAND worm gearing now has a part in a new kind of sea rescue. Just after the war, for the first time, a Vickers hydraulically-operated winch mounted on a helicopter hoisted two men to safety when an oil barge ran aground. Now use of the winch is standard practice, replacing hard-to-climb rope ladders previously used.

Vickers Inc. chose Cleveland worm gearing to drive the winch because it is small enough and light enough to satisfy rigid weight and bulk restrictions and is capable of governing efficiently sudden stops and starts and changes of direction involved in rescue work. To date Cleveland worm gearing has participated in over 1700 Korean missions.

Cleveland manufactures worm gearing and worm gear speed reducers in a wide range of types and sizes, large and small, to meet the requirements of any machinery builder or user. Write today for Catalog 400. The Cleveland Worm and Gear Company, 5270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers, Limited.

THE APPLICATION OF MAGNETIC AMPLIFIERS TO STEEL MILL CONTROL CIRCUITS



THE MAGNETIC AMPLIFIER

The magnetic amplifier as a motor control component has taken the electrical world by storm. Here is a unit that is simple in construction, that has no moving parts to wear out or get out of order . . . yet when properly designed and constructed and when properly engineered into a control scheme is capable of some of the most amazing control functions. Its response is swift, measured in a fraction of a second. It is accurate. It is immune to vibration and shock. Because of numerous installations Cutler-Hammer engineers have the knowledge and experience to properly apply the magnetic amplifier to control circuits of every kind.

Cutler-Hammer's practical knowledge of this newly useful component assures correct and efficient solution of your control problems.

With a background experience gained by more than 50 years' intimate contact with the control problems of the Steel Industry, Cutler-Hammer engineers now bring to the Industry the knowledge and practical benefits of recent developments of the magnetic amplifier. The simple electrical and mechanical construction, the absence of moving parts, the tremendous versatility, the immunity to shocks and vibration, and the dependability of the magnetic amplifier recommend it to any steel mill man seeking higher production, better performance and more uniform operation in a wide variety of mill applications. If you have a problem involving:

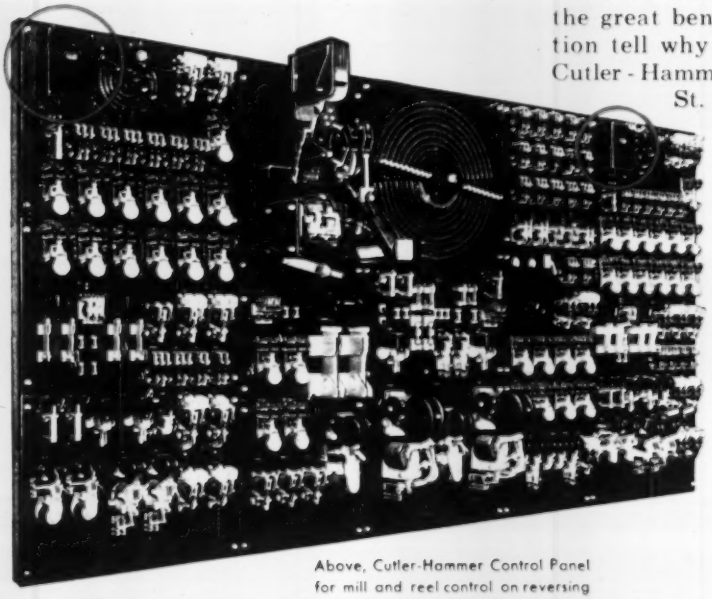
Tension control	Acceleration
Voltage regulation	Positioning
Speed control	or any combination of these,

bring it to Cutler-Hammer.

The adaptability which the magnetic amplifier has in its performance characteristics and the need for skilled engineering experience of the subject are factors that suggest its application by men *competent* to do so.

Versatility and dependability explain the great interest of the Industry in this new method of control; and the great benefits derived from its proper application tell why experienced mill men are coming to Cutler-Hammer. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin.

Associate: Canadian Cutler-Hammer, Ltd., Toronto, Ontario.



Above, Cutler-Hammer Control Panel for mill and reel control on reversing strip mill, utilizing magnetic amplifiers.

CUTLER-HAMMER
MOTOR CONTROL
C-H